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BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

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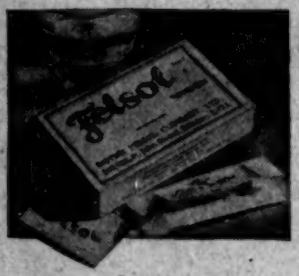

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 24 1943

NUTRITIONAL IRON DEFICIENCY ANAEMIA IN WARTIME

PART II

THE HAEMOGLOBIN LEVELS OF 3,338 PERSONS FROM BIRTH TO 55 YEARS OF AGE

BY

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(From the Department of Medicine, University of Edinburgh)

In a previous communication (Davidson *et al.*, 1942) we reported on Part I of this investigation—the haemoglobin levels of 442 infants and pre-school children (birth to 4 years) and 389 school children (5 to 12 years). We now submit data from a more extensive survey. All the haemoglobin examinations were made under standard conditions of technique and lighting by one member of the team who has had a very wide experience and whose ability to match colours is particularly good.

Since the publication of our previous paper a correction factor for the pipette, dilution tube, and colour tube of the Haldane haemoglobinometer used has been supplied by the National Physical Laboratory. This correction factor varies with the haemoglobin readings—e.g., between the ranges 53 and 87% our instrument gives readings approximately 2% low. The correction factors have been applied to all the Edinburgh figures in the present communication.

This paper is concerned solely with the incidence of iron-deficiency anaemia. Investigations into the aetiological factors concerned in its production, and therapeutic trials for its correction, will be reported in a separate communication.

Infants and Pre-school Children (from Birth to 4 Years)

An additional group of 121 infants and pre-school children has been investigated, making a total of 563. The data obtained have provided no reason for materially altering the conclusions reached in the previous paper, that the Edinburgh series (1942) shows an improvement over the Aberdeen series (1935) (Davidson and Campbell, 1935 ; Davidson and Fullerton, 1938).

School Children (5 to 12 Years)

The number of school children investigated has now been raised from 389 originally reported to 1,022. Of these children 917 were examined at Edinburgh Education Authority primary schools, and came mainly from working-class families, while 105 were attending private schools and came from a much higher social and economic stratum of the population. The increase in the number investigated and the result of applying the correction factor necessitate a reconsideration of this group. Table I gives the average haemoglobin levels according to age and social status in Edinburgh school children, and Table II

TABLE I.—*The Haemoglobin Averages of School Children according to Age and Social Status*

		Age (Years)							
		5	6	7	8	9	10	11	12
Edinburgh: Municipal primary-school children	917	81·3% (61)	81·7% (118)	83·1% (118)	81·0% (139)	83·9% (143)	83·4% (155)	82·8% (116)	84·3% (67)
Edinburgh: Private-school children	105	—	85·0% (8)	86·0% (10)	90·5% (4)	90·4% (18)	93·7% (17)	93·5% (22)	94·0% (26)

TABLE II.—*Comparison of Anaemia in 3 Groups of School Children (5 to 12 Years)*

		Percentage of Children in Different Haemoglobin Ranges			
	Hb:	< 71%	71–80%	81–90%	> 90%
Edinburgh, 1942: Municipal primary schools	917	3·8	35·5 (39·3)	45·0	15·7 (60·7)
Edinburgh, 1943: Private schools	105	—	4·7 (4·7)	38·1	57·2 (95·3)
London: (Mackay *et al.*, 1942)	128	42·0		58·0	
Aberdeen (Davidson and Campbell, 1935)	67	0		100·0	

a comparison of the haemoglobin ranges of school children in Edinburgh (1942), London (1942) (Mackay *et al.*, 1942), and Aberdeen (1935) (Davidson and Campbell, 1935 ; Davidson and Fullerton, 1938).

Our previous acceptance of a haemoglobin level of 95±5 as the normal standard for the age group 5 to 12 years is supported by our finding that the average haemoglobin percentage of 105 children attending private schools was 91.7, and that 57% of these children had haemoglobin figures of 90 to 110%. The term " clinical anaemia " has been arbitrarily employed by us to connote a haemoglobin level of 80% or less in school children. On this basis 39% of municipal primary-school children and less than 5% of private-school children were anaemic. The conclusion reached in the previous paper that the haemoglobin level in children of working-class families of the age period 5 to 12 years is decidedly lower in Edinburgh (1942) than in Aberdeen (1935) still holds good. The average difference of 10% haemoglobin as reported in our previous article is now, however, reduced to 8% when the correction factor for the haemoglobinometer is applied.

It will be noted in Tables I and II that a marked difference in the haemoglobin levels and ranges is found when the 917 children drawn mainly from working-class families are compared with the 105 children from the well-to-do classes. Accordingly the conclusion in our previous paper that economic status was no longer the principal factor influencing the nutrition of the individual must be reconsidered.

We have now repeated the haemoglobin estimations of children at two municipal primary schools examined in 1942, and it is of interest to note that the haemoglobin levels have improved during the past 12 months. Further investigations into this finding are being undertaken.

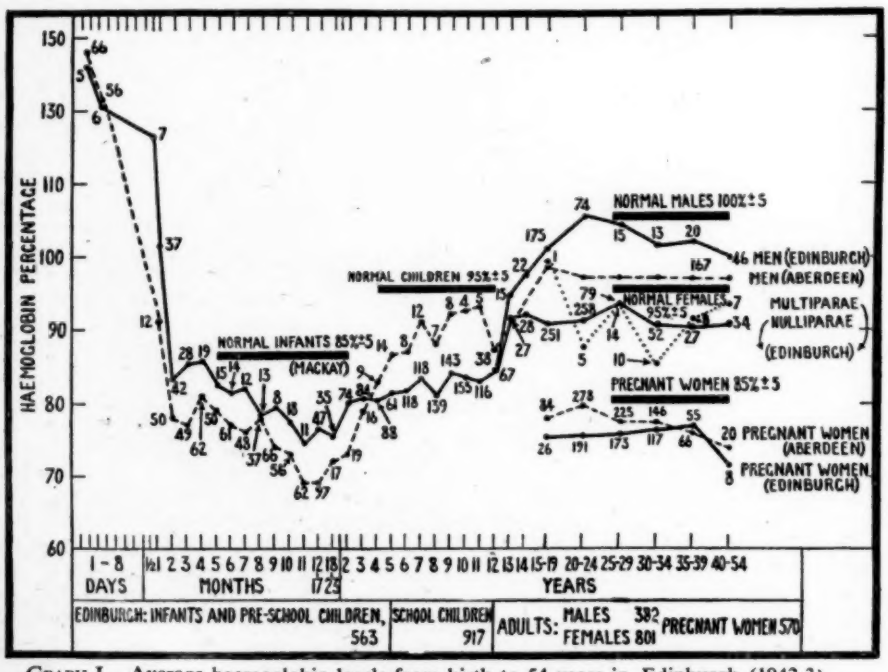
Haemoglobin Ranges of Adolescent and Adult Males and Females of Various Occupations

Table III shows the haemoglobin ranges of 1,753 individuals grouped according to occupation. The table is arranged in this way rather than according to age groups because of the wide variation in haemoglobin ranges found in persons of the same age group working and living under different conditions.

The schoolboys and schoolgirls (13 to 18 years) were attending private schools used by people of the well-to-do classes. The male and female students, the nurses, and the maids were all working in a large voluntary teaching hospital. The female factory-workers were employed in three different establishments. The 62 individuals in factory A were employed in a foundry, necessitating very heavy physical work. We were informed that the incidence of anaemia in this group was high, but, as will be seen from Table III, less than 5% were suffering from clinical anaemia (below 80% haemoglobin). The pallor of their faces, which was so noticeable, was apparently due to fatigue and not to anaemia. It should be noted that the majority of these workers had been employed in the foundry for only a few weeks before examination, and this might account for the wide difference in the incidence of anaemia in factories A and B.

TABLE III.—*Haemoglobin Ranges according to Occupation*

	No.	<60%	61–70%	71–80%	81–85%	86–90%	91–100%	101–110%	>110%	Av. Hb%
Schoolboys (13–18 years)	159	—	—	—	0·6% (1)	4·4% (7)	52·2% (83)	41·5% (66)	1·3% (2)	99·5%
Schoolgirls (13–18 years)	121	—	—	6·6% (8)	10·7% (13)	17·4% (21)	51·2% (62)	14·1% (17)	—	93·2%
Female students	100	—	—	1·0% (1)	11·0% (11)	17·0% (17)	53·0% (53)	18·0% (18)	—	93·8%
Nurses	100	—	—	1·0% (1)	18·0% (18)	15·0% (15)	57·0% (57)	9·0% (9)	—	92·3%
Maids	59	1·7% (1)	1·7% (1)	10·1% (6)	11·9% (7)	16·9% (10)	50·9% (30)	6·8% (4)	—	90·3%
Female factory-workers (A), nulliparous	62	—	1·6% (1)	3·2% (2)	14·5% (9)	11·3% (7)	53·2% (33)	16·2% (10)	—	93·1%
Female factory-workers (B) (no iron), nulliparous	65	—	7·7% (5)	13·8% (9)	13·8% (9)	29·3% (19)	32·3% (21)	3·1% (2)	—	87·3%
Female factory-workers (B) (on iron), nulliparous	201	—	5·4% (11)	10·0% (20)	11·9% (24)	22·4% (45)	46·8% (94)	3·5% (7)	—	89·3%
Female factory-workers (C), nulliparous	48	—	—	6·2% (3)	2·1% (1)	39·6% (19)	41·7% (20)	10·4% (5)	—	91·8%
Multiparous women	45	—	6·7% (3)	8·9% (4)	6·7% (3)	20·0% (9)	51·0% (23)	6·7% (3)	—	90·9%
Pregnant women	570	6·3% (36)	17·7% (101)	48·3% (275)	16·5% (94)	7·0% (40)	4·2% (24)	—	—	75·8%
Male students	100	—	—	—	—	—	13·0% (13)	71·0% (71)	16·0% (16)	105·7%
Male factory-workers (B)	123	—	—	0·8% (1)	0·8% (1)	5·7% (7)	39·0% (48)	49·6% (61)	4·1% (5)	100·5%



GRAPH I.—Average haemoglobin levels from birth to 54 years in Edinburgh (1942-3) and Aberdeen (1935).

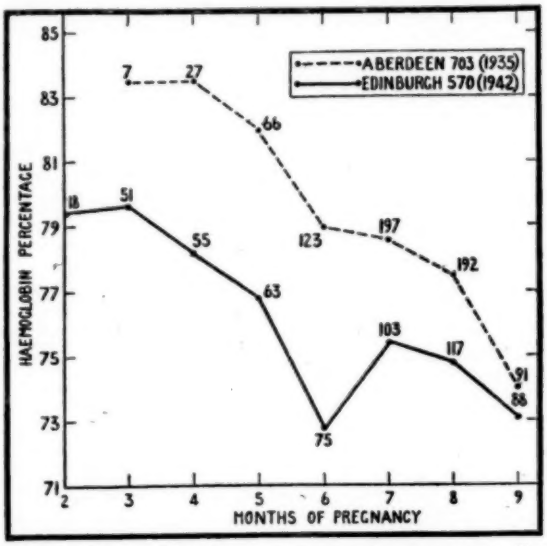
After arrangements had been completed for examining the haemoglobin levels of workers in factory B it was discovered that the factory medical officer had offered 10 gr. of Blaud's pill daily to any worker who wished it. It was found that about 75% of the employees had been taking the iron supplement for at least three months before the haemoglobin levels were estimated. No selection of employees had been made by the factory medical officer as regards the particular need for iron, and the groups whose haemoglobin values are displayed in Table III represent an unselected cross-section of these employees.

Factory C consisted of a laundry in which 48 women were employed. Of the 123 male factory-workers working in factory B 85 had received no iron and 38 had had the supplement of iron. As no significant difference in the haemoglobin levels in these two groups of males was found it was not considered necessary to give the groups separately in the table. No beneficial effects would be expected from the iron supplement, since clinical anaemia was present to an insignificant degree. The haemoglobin levels of 45 multiparous women examined at factories A and B and at welfare centres are shown separately in Table III. The 570 pregnant women were examined at four separate ante-natal clinics in Edinburgh in order to get a cross-section of the population. Their haemoglobin levels according to age are shown in Graph I, and according to month of pregnancy in Graph II.

Incidence of Clinical Anaemia

In a leading article in the *British Medical Journal* (1943, **1**, 449) doubt was expressed as to whether Price-Jones's (1931) figures of 98% for a female and 105% for a male should be accepted as normal standards of haemoglobin for the population as a whole. The figures which we have accepted as average normal, but not necessarily optimal, standards are for females 95% ± 5, and for males 100% ± 5. We believe that the evidence afforded by this paper supports the contention that such standards can be maintained even under wartime conditions, since 50 to 70% of the females in the different groups examined have figures of 90% and higher, and the average haemoglobin of 382 males was slightly over 100%. If haemoglobin levels of this magnitude are found after nearly four years of war with its concomitant dietary restrictions and difficult working conditions, then there is reason to believe that average haemoglobin levels even higher than those proposed by Price-Jones might obtain in days of peace. In the same leading article it was also suggested that the term "anaemia in females" should be restricted to haemoglobin levels below 80%—a figure 15% below the standard accepted by us for normal women. We accept this definition as a basis for discussion although we realize that the level chosen is purely

arbitrary. We would suggest on the same basis that a figure of 85% haemoglobin or less be accepted as the level of "clinical anaemia" in males. The haemoglobin levels lying between these figures and the normal standards suggested above would then be considered as subnormal. Although we are not aware of any evidence that such subnormal haemoglobin levels have any proved adverse influence on the well-being of men and women, we consider on general principles that it is unwise to be satisfied with figures below the accepted standards of normality.



GRAPH II.—Haemoglobin levels of pregnant women according to month of pregnancy.

With regard to what should be accepted as normal haemoglobin levels for pregnant women marked difference of opinion exists because of the influence of the varying physiological dilution of the blood which occurs with advancing pregnancy. According to Dieckmann and Wegner (1934), a 5%, 10%, and 15% dilution of the blood takes place during the first, second, and third trimesters of pregnancy respectively. If a group of pregnant women in which approximately equal numbers are in the different trimesters be examined, then a deduction of 10% of the haemoglobin level should be made. On this basis "clinical anaemia" due to pregnancy may be said to exist when the haemoglobin level falls below 70%—i.e., 10% below the level of "clinical anaemia" in non-pregnant women.

Applying the above standards to the figures given in Table III, the incidence of "clinical anaemia" is found to be insignificant in female students and nurses, and varies from 6.6% in schoolgirls (13 to 18 years) to 21% in female factory-workers. The incidence of anaemia in 360 adolescent females (13 to 19 years) and 450 adult females (20 to 54 years) was 12% and 7% respectively. Approximately 60% of the total had a haemoglobin value greater than 90%. The incidence of "clinical anaemia" in 212 adolescent males and 170 adult males was less than 1%, and of these 95% had a haemoglobin level exceeding 90%. The incidence of "clinical anaemia" in 570 pregnant women was 24%.

Although it will be seen that a considerable degree of "clinical anaemia," as defined above, was present in school children and in certain groups of females, both pregnant and non-pregnant, it should be noted that the great majority of such persons made no complaint of ill-health and were apparently carrying out their work in the school, factory, or home in a satisfactory manner.

Comparison of Incidence of Anaemia in Edinburgh (1942) and Aberdeen (1935)

In assessing the effects of war conditions on the incidence of anaemia in the population at large it would be of great advantage to compare the findings of the Edinburgh survey (1942) with similar pre-war investigations. For accuracy in such comparisons it would be necessary to use a standard technique and to have the pipette and graduation and colour tubes calibrated and checked according to some accepted standard, as was done in the present survey. It is most desirable that this principle should be generally accepted from now onwards. An attempt was made to obtain the instrument used in Aberdeen in 1935 in order to have it checked by the National Physical Laboratory, but unfortunately only the Haldane colour tube was available for testing. The correction figure supplied by the National Physical Laboratory shows that it gave readings approximately 2% too high. It is impossible to say whether this error can be accounted for by a slight fading of the colour tube during the past eight years or whether it was present in 1935. Since the pipette and dilution tube are not available for checking, it is impossible to assess the accuracy of the figures obtained in 1935. An extensive experience with the instrument concerned showed that haemoglobin figures of 100% ± 5 and 95% ± 5 for average normal males and females respectively were regularly obtained, together with a colour index of unity. Accordingly we believe that the instrument was in fact reasonably accurate. Hence we feel justified in making the following comparisons, provided the limitations discussed above are kept in mind. The Aberdeen figures shown on Graph I are the original uncorrected ones.

(*a*) The haemoglobin levels of infants and pre-school children in Edinburgh (1942) are slightly higher than those found in a similar age group in Aberdeen (1935).

(*b*) The incidence of "clinical anaemia" in municipal primary-school children in Edinburgh (1942) is considerably higher than in Aberdeen (1935).

(*c*) The incidence of "clinical anaemia" in adolescent and adult males in Edinburgh (1942) and Aberdeen (1935) is insignificant, but the haemoglobin levels are somewhat higher in the Edinburgh series.

(*d*) No significant change was observed in the haemoglobin levels of adolescent and adult females examined in Edinburgh (1942) and in Aberdeen (1935). Thus a haemoglobin level of less than 85% was found in 23% of 306 adolescent females and 18% of 450 adult nulliparae in Edinburgh, as compared with 18% of 450 adolescent females and 25% of 50 adult nulliparae in Aberdeen.

(*e*) The haemoglobin levels of pregnant women examined in Edinburgh (1942) are slightly lower than those of a similar group examined in Aberdeen (1935).

Summary

The haemoglobin levels of 3,338 individuals examined in Edinburgh in 1942–3 are reported. These comprise: 563 infants and pre-school children (birth to 4 years); 917 municipal primary-school children (5 to 12 years); 105 private-school children (5 to 12 years); 518 adolescent males and females (13 to 19 years); 620 adult males and females (20 to 54 years); 45 multiparous women; 570 pregnant women.

The pipette, dilution tube, and colour tube of the Haldane haemoglobinometer used in this investigation were examined by the National Physical Laboratory and a combined correction factor was supplied. This factor has been applied to all the haemoglobin figures of the Edinburgh series shown in the tables and graphs of the present communication.

Standards of normality of haemoglobin levels for individuals according to age and sex are discussed and defined, and arbitrary figures below which clinical anaemia may be said to be present have been selected.

"Clinical anaemia" was found to be present in 39% of municipal primary-school children; approximately 5% of private-school children; 12% of adolescent females; 7% of adult females; 24% of pregnant women; and less than 1% of adolescent and adult males.

We wish to express thanks to our medical colleagues, to the Medical Officer of Health for Edinburgh and his staff, and to the head masters and staffs of schools for the facilities and help afforded during this investigation.

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A new edition, the 4th, of the *Register of Orthoptists* has now been published by the Board of Registration of Medical Auxiliaries. A copy can be obtained free on application to the acting secretary of the Board, B.M.A. House, Tavistock Square, W.C.1.

CHILDHOOD INFECTION AND ITS RELATION TO ADOLESCENT AND ADULT PULMONARY TUBERCULOSIS

A RECORD OF THE WORK OF THE BROMPTON HOSPITAL RESEARCH DEPARTMENT DURING THE LAST 14 YEARS

PREPARED BY

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[*Drs. G. E. Beaumont, Dorothy Cooper (née Dow), Maurice Davidson, J. L. Livingstone, W. Ernest Lloyd, A. Margaret C. Macpherson, R. C. Wingfield, and F. H. Young have from time to time been responsible for or associated with the various investigations of the Brompton Hospital Research Department during the past fourteen years. They may be regarded, therefore, as signatories of this paper, but cannot hold themselves accountable, each and severally, for all the views expressed and for all the conclusions reached in this collected record.*]

On March 21, 1928, the Medical Committee of the Brompton Hospital decided to promote and encourage research at the hospital by (1) the organization of a research department, and (2) the institution of a research fund. The Research Department accordingly came into being. Apart from the other activities covered by its constitution, it was felt that the problem forming the title of this paper was one which should be studied. A subcommittee of the staff (whose personnel has changed from time to time) was therefore appointed; suitable assistance was obtained with the help of the Research Fund, and the investigation was started. To the generous contributors to the research fund our thanks are due, but in particular to the Sir Halley Stewart Trust, all of whose contributions have been devoted to this special piece of work. The investigation is not yet finished; it may be years, if ever, before it is, but it is felt that enough has already been done to justify (1) a summary of the results from the various reports published to date; (2) an indication of the lines on which the investigation is proceeding at the present time.

Childhood tuberculosis was the subject studied for the most part when the department was first opened, and we believe that our findings have to some extent helped to build up the picture of this condition as it exists to-day. This aspect of tuberculosis is still prominent in the work of the department, and observation of the children continues. The number of children seen up to the present is 2,482. At the same time, during the fourteen years attention was constantly focused on the disturbing problem of tuberculosis in young adults—a problem of such importance at the present day, and promising to become of such urgency in the near future, that it calls for immediate action. Recognizing this, and the need for more definite observations on the subject, we set ourselves to investigate certain of its aspects. These investigations have brought to light some interesting facts and have led to our present study of treatment of symptomless pulmonary tuberculosis in young adults. Although as yet we cannot provide any definite results of treatment, we consider the matter to be of sufficient immediate interest to justify the publication of the way in which we are tackling the question.

The first task undertaken by the Research Department was the elucidation of some of the problems of childhood tuberculosis which at that time were still obscure. No appreciable amount of work on this subject had been carried out in this country. Among the established facts about childhood tuberculosis were the figures of the mortality rates, which showed a great fall during the present century. It was decided to analyse the figures for this period, and this formed the substance of Report I.

Report I (1930): "Tuberculosis Mortality in Children" (Lloyd and Dow, 1932a)

Analysis of the mortality rates from tuberculosis in children for the period 1898 to 1927 in England and Wales brought out the following interesting facts:

1. The decline in the mortality rate was greatest for children under 5 years old.

2. The rate of fall due to abdominal tuberculosis was greater than the rate of fall due to other forms, and in 1927 meningitis was by far the most fatal form of tuberculosis.

3. Although the mortality rate due to tuberculosis was greater in infancy than in later childhood, when taken in relation to the mortality rate from all causes tuberculosis is a much less frequent cause of death in young children than in those approaching adult life.

4. Before 1914 the 0–5 years age group had the highest tuberculosis mortality rate; since 1914 the tuberculosis mortality rate has been consistently higher in young adult life and middle age than in the 0–5 years group.

5. With the decrease in the mortality rate due to tuberculosis in the 0–5 years group the mortality peak in adult life changed from the 40–50 years group to the 20–25 years group.

6. The importance of exposure to tuberculous infection was demonstrated clearly by the fact that among the families attending Brompton Hospital there was a definitely increased death liability from tuberculosis in children aged 0–5 years who were brought up in contact with open cases of tuberculosis.

This report, while emphasizing the improved position of tuberculosis in childhood, underlined the continuing and relatively increasing menace of young adult tuberculosis. This was a problem that was continually demanding recognition and suggested further investigations, which were begun at this time but were reported at a later date.

In the meantime, the connexion between exposure to tuberculous infection and mortality due to the disease in infancy was an important finding which could with benefit be investigated still further and which might lead to solutions of practical value. If deaths from tuberculosis in childhood were related to exposure to infection, what was the relation between contact history and tuberculous morbidity in the living child? In other countries extensive tuberculin-testing had been carried out in the childhood populations. The results of these tests showed that, although the actual figures varied considerably in different countries and localities, the number of positive reactions to tuberculin was high in children exposed to infection when compared with those with no known contact with infection. It was thought that a similar investigation carried out in this country might be of value, and this was the next piece of work undertaken by the department.

Report II (1931): "The Incidence of Tuberculous Infection and its Relation to Contagion in Children under 15" (Lloyd and Dow, 1931, 1932b)

During 1930 and 1931 1,220 children attending the out-patient department at the Brompton Hospital were subjected to a tuberculin test. A comparison was first made between the two methods then in vogue in Europe, Scandinavia, and the U.S.A.—namely, the Pirquet test and the Mantoux intradermal test. The results showed that the Mantoux was the more accurate, and that the Pirquet was about equivalent to the Mantoux using 1 in 10,000 dilution of old tuberculin.

The results among this group of the population corresponded in the aggregate with those of observers in other countries, and demonstrated certain important facts. Taking the children as a

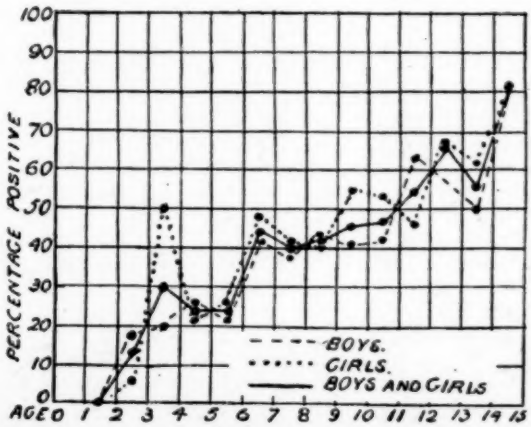

FIG. 1.—Percentage of children who reacted to the Mantoux test, arranged according to age and sex groups.

whole, there was a steady increase in tuberculous infection from birth to 15 years of age (see Fig. 1). If, however, the children who had a history of exposure to an open case of tuberculosis were separated from those with no known contact the results were very different. It was found that the number of positive reactors was almost doubled in the contact group taken as a whole compared with the non-contact group. The difference was still more marked in younger children, the number of positive reactors being five times greater in children under 5 years old in the contact group than in the non-contact group (see Fig. 2).

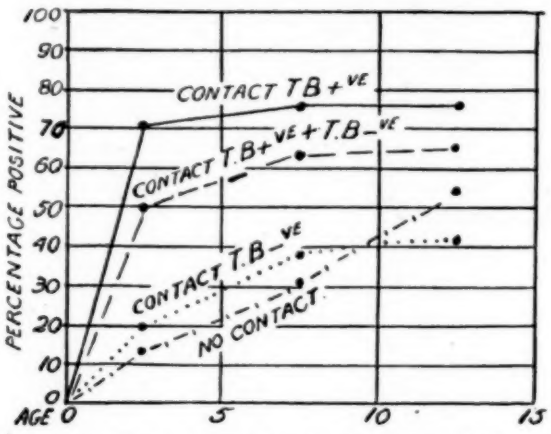

FIG. 2.—Percentage of contact and non-contact children who reacted to the Mantoux test, arranged in age groups.

The significance of direct contact with the tubercle bacillus was still further stressed by the fact that the results of tuberculin-testing in a group of children with no history of contact scarcely differed from the results obtained in a group of children with a history of contact with a *closed* case of tuberculosis (Fig. 2).

Although these facts had been established in other countries the results in this report were among the earliest published in England to show the importance of the connexion between contact with open cases of tuberculosis and tuberculous morbidity in children. The findings underlined the importance of contact history; the previous report had shown its importance in relation to tuberculosis mortality, and this later investigation its importance in relation to tuberculous morbidity in the living. The tuberculin test had provided us with valuable evidence of tuberculous infection in the living, and apparently healthy, child: was there any means of demonstrating, and possibly arresting, the tuberculous lesion resulting from this infection?

The low rate of mortality in childhood compared with the higher rate of morbidity gave little hope of help from clinical findings, but *x*-ray investigation might bring to light valuable information. Such investigations in the U.S.A. were creating much interest, and it was decided to make a systematic examination of tuberculin tests and *x*-ray findings in the children in the out-patient department at the Brompton Hospital.

Report III (1932): "A Comparative Study of *X*-ray and Mantoux Reactions in Children" (Lloyd and Dow, 1932c, 1932d)

During 1930 and 1931 500 children under 15 years of age were examined clinically and radiologically and had a tuberculin test. In order to assess the value of the radiographs without prejudice, these were examined and reported on without previous reference to the Mantoux reaction. This investigation made manifest the difficulties of interpretation of radiographs in children, and the conclusion was reached:

> "that in attempting to localize the lesions in children who are shown to be tuberculous by a positive Mantoux reaction, the chest radiograph is not so helpful as might have been supposed. . . . While the chest radiograph is of great clinical value . . . its interpretation in the 'Mantoux-positive' child needs the greatest care."

Although the interpretation of these radiographs was difficult, it was evident that typical lesions of the adult type of pulmonary tuberculosis were comparatively uncommon in children under 15 years of age.

In order to keep in touch with this large group of interesting children a "follow-up" department had been by this time established, and it was possible during the ensuing years to augment the findings of these last reports. There are now 989 children who have attended the follow-up clinic for a period of from 2 to 13 years; of these 756 are "contact" children, and the rest continue to attend either as controls or because they have evidence of tuberculous lesions. While the children are still in contact with cases of tuberculosis they come for examination at least once in every three months. After contact with infection has ceased and there is no evidence of any active tuberculous lesion the attendances are extended to once in six months.

Report IV (1933): "Reinvestigation of Mantoux-positive Children" (Lloyd and Macpherson, 1933a, 1933b)

After an interval of 1½ to 2 years 700 of the children included in Report II were subjected again to the Mantoux test. It was found that the great majority (96%) of the positive reactors in 1930 remained positive in 1½ to 2 years' time. There was, however, a change during this period in the degree of sensitivity: those who at the first testing reacted only to the stronger doses tended to become more sensitive. The figures also showed that a high degree of sensitivity was reached at an early age in contact children, whereas in the majority of non-contact children this degree of sensitivity was not reached at any age during childhood.

Throughout this and the subsequent investigations very few cases of active pulmonary tuberculosis were met with, and, in fact, obvious clinical tuberculosis among the children was conspicuously low throughout our observations.

In Report III the difficulties encountered in the interpretation of chest radiographs in children were described, and these, together with many diagnostic problems which made their appearance while observing the children in the "follow-up" department, showed the necessity for a more detailed study of the course of childhood tuberculosis. Between 1930 and 1939 considerable material had become available in the department, and by means of serial radiographs over a period of years it was possible to solve some of the problems which had presented themselves at the beginning and to build up a picture of the primary tuberculous lesion in childhood.

Report VII (1939): "Primary Tuberculosis of the Lungs in Childhood" (Macpherson, 1939a, 1939b)

This report contained a description of the primary tuberculous lesion of the lung and its subsequent course as it appeared among the children in the follow-up department. It was noted that the normal course of the primary lesion was usually uneventful and was unattended by clinical symptoms or signs, and in most cases was evident only in the *x*-ray film. Attention was drawn to the fact that the process of healing occupied more than one year and that throughout this period the focus was a potential source of dissemination. It was stressed that during this time it was advisable to facilitate healing by procuring a suitable environment for the child and to keep a close watch on the progress of the lesion.

Another characteristic of the primary complex was the relative unimportance of the lesion in the lung tissue compared with the lesions in the lymph nodes. It was these infected lymphatic glands which were more likely than the lung lesions to produce complications and to give rise to clinical evidence of disease. The relation between the glandular involvement and subsequent atelectasis and bronchiectasis was discussed. In only one case—that of a girl infected between the ages of 13 and 15 years—was the primary lesion seen to spread and to give rise to fibro-caseous disease of the adult type. The pulmonary lesions otherwise tended to heal by fibrosis or calcification.

So far the work carried out on childhood tuberculosis had demonstrated clearly that:

1. Primary infection by tubercle bacilli usually is uneventful clinically and the lesion formed heals satisfactorily in most cases.

2. Certain immediate and later complications may, however, arise, as a rule secondarily to the involvement of lymphatic glands in the primary complex.

3. Tuberculous meningitis has been, and still is, a serious outcome of tuberculous infection.

4. Tuberculous morbidity and mortality in childhood are markedly influenced by exposure to infection.

5. The "adult type" of tuberculosis does not present a serious problem in childhood.

6. Relatively to pulmonary tuberculosis in childhood, and even to tuberculous meningitis in childhood, pulmonary tuber-

culosis in adolescence and early adult life is a greater menace to the population.

The mortality rate from pulmonary tuberculosis among young adults showed little evidence of decreasing, and the matter continued to cause great concern. Here, then, was a subject bristling with problems for further elucidation and asking for a direct and immediate attack. Obviously it would be of immense value to establish a definite aetiological connexion between childhood infection and tuberculous disease in later life, but such an undertaking would require much material and occupy many years before there was any hope of providing a full and definite answer. However, the large numbers of observations we had been able to make in the follow-up department supplied us with some interesting evidence which to a certain extent indicated the relation between childhood infection and adolescent pulmonary tuberculosis. As some of those under observation passed from childhood to adolescence, adult types of lesions began to appear, usually between the ages of 15 and 19.

These lesions were as a rule localized to the upper third of the lung. In the majority of cases they were not accompanied by any clinical disturbances or by loss of weight, and in some instances there was not even an increase in the sedimentation rate. If left untreated the lesion showed a "pendulum" action, alternating between a spread of the lesion and healing, but nearly always with a tendency to spread and seldom healing spontaneously. The period of time between the first appearance of the lesion in the *x*-ray film and the first symptoms varied between three and five years.

These observations led us to a closer study of pulmonary tuberculosis in the young adult, and the next report dealt with the problem of contact history in pulmonary tuberculosis of young adults.

Report VI (1937): "Pulmonary Tuberculosis in Young Adults: The Significance of Contact History" (Lloyd and Macpherson, 1936, 1937)

Report VI contained an analysis of the family histories of 1,000 patients at the Brompton Hospital who had developed pulmonary tuberculosis between the ages of 15 and 25. The fact that there was a history of contact with tuberculosis before the onset of the disease in 40% of the cases was significant. Among those with a family history of tuberculosis, contact with a tuberculous brother or sister was found to be as frequent as contact with a tuberculous parent. Four out of five of the patients who gave a history of contact developed the disease within five years of the exposure to the last known contact with infection. This report again stressed the importance of contact history, and the conclusions also suggested that reinfection in adolescence or early adult life might play an important part in the onset of young adult lesions.

Another aspect was constantly making itself apparent: the advanced stage of tuberculosis reached before treatment was begun or was even sought by the young adult. To quote from the introduction to Report V: "Too many patients do not seek treatment until their disease is well entrenched. This undoubted fact is the reason why our tuberculosis service spends most of its energies, time, and money in endeavouring to patch up hopelessly damaged individuals by preventing further activity and inroad of the disease."

Those entrusted with the care and treatment of these young adults were repeatedly putting forth pleas for earlier diagnosis. But the fact remained that examination immediately the classical symptoms of early pulmonary tuberculosis were detected often showed considerable lesions in the *x*-ray films.

A hypothesis was formed "that perhaps the extensive lesions of adult disease are really in many cases deposited during adolescence with the accompaniment of slight or, at any rate, unexplained constitutional disturbance: that these lesions are carried unrecognized, perhaps extending slowly and without symptoms, until they make their presence known in adult life, either by reason of their spread past a definite point or because some environmental cause has allowed of their reactivation"; and our hitherto unpublished observations from the follow-up department on the symptomless lesions of adolescence (see above) tended to strengthen this hypothesis.

The testing of the hypothesis involved the radiological examination of a number of healthy adolescents.

Report V (1936): "Latent Adolescent Pulmonary Tuberculosis" (Wingfield and Macpherson, 1936a, 1936b)

During 1934 and 1935 such an investigation was undertaken. 2,381 young people between 14 and 21 years old, healthy and at work, were examined and the first record of mass radiography of a sample of the English population was published in 1936.

The results of this investigation showed that there was a definite incidence of pulmonary tuberculosis in 0.65% and a possible incidence in 1.08% of our sample of the adolescent population. Comparison between these figures and the calculated incidence of pulmonary tuberculosis in the population (0.4 to 0.75%) gave support to the hypothesis set forth above. Here, then, was a means of detecting at a really early stage adolescent lesions which later would give rise to clinical disease, and a means of providing the clinicians with material at a stage in which treatment should be easy compared with well-established lesions which they cannot hope to cure but only to arrest.

It was not overstating the case when it was remarked at this stage in Report V: "The significance and implications of this are tremendous." The report ended with a plea for further and more extensive investigations.

This was in 1936. It has taken much education and propaganda, directed during the ensuing years to the medical profession and the lay public alike, to bring about the development and application of the suggestion put forward at that time that mass radiography is a necessary weapon for the detection of pulmonary tuberculosis at a stage in which treatment, from the patient's point of view, could be of real value and, from the point of view of the State, far more economical than heretofore. It has been encouraging to find that recent examinations by mass radiography with more accurate apparatus and in more satisfactory conditions have produced results very similar to ours.

Since this report on latent adolescent primary tuberculosis and following on the observations, to which reference has already been made, on the development of these lesions among those attending the follow-up department, attention has been constantly focused on the problem of treatment of those adolescents without symptoms but with radiological evidence of the disease. Recognizing that this would become a major problem should mass radiography be adopted, it was obviously necessary to examine the possibilities of adequate treatment from the point of view of healing the lesion and from the economic standpoint.

A healthy youth, working and playing hard, with no symptoms, is suddenly singled out from his companions and told that he has evidence of pulmonary tuberculosis. The first and very real difficulty is to persuade the boy or girl that further investigations are necessary. Fortunately, as a result of recent propaganda on the value of radiological examinations, this is becoming easier, but it is often more difficult to persuade the patient's doctor to take the matter seriously. These difficulties overcome, the patient is usually admitted into hospital for investigation. It is not uncommon that, apart from the radiographs, every finding is normal; there may be no abnormal physical signs, no pyrexia, a normal blood sedimentation rate and normal gain in weight.

According to the hypothesis propounded in Report V, these adolescents are the very people who eventually will develop manifest disease. It is therefore folly to continue observation without treatment in the hope that the case in point may be the exception which proves the rule. This course is often desperately advocated by the boy or girl and the parents, and unfortunately is too often adopted by the doctor in charge. In some cases on our records the patient won the battle; treatment was postponed until symptoms appeared, with the result that only a "patching-up" of the individual was possible, while the value of the early *x*-ray examination had been entirely lost. Healing, surely, and not just temporary arrest, should be possible, and should be the aim when these early lesions are under consideration.

Some form of treatment, therefore, is called for, and at this stage the economic factor comes into prominence and must influence the course followed. At the present time such cases when detected, are handled in one of the four following ways: (1) they are either ignored or are merely observed for a period; (2) they are kept under careful observation, with improvement

in their home environment; (3) they are sent to a sanatorium; (4) they are, in only a few instances, treated by artificial pneumothorax.

Treatment of Symptomless Adolescent Pulmonary Tuberculosis

For those who can afford the time and treatment it is probable that with rest at home, followed by gradually increasing activity and then by years of sheltered life, healing may take place. It is, however, only a favoured few who can afford this; for the majority a more rapid return to work is necessary. Moreover, it is unusual to find any person who, while apparently in good health, will submit to this treatment and at the same time retain a healthy outlook on his "illness," also the capacity to return to a normal life at the end of it.

For the majority, therefore, some other course is advised. Sanatorium treatment is the usual one adopted for these patients. Owing to the healthy condition of the patient on admission to the sanatorium and the constant urge to get home and back to work, it is usually impossible to keep him or her at the institution long enough to hope to effect a cure. There may be a temporary improvement in a few cases, but in the majority there is no material change in the *x*-ray picture, and the expected spread of the disease comes sooner or later after a variable interval.

It seems that artificial pneumothorax provides a more satisfactory prospect; we believe that this is the correct treatment for these cases, and it is the one which has been adopted. These symptomless patients should be ideal subjects for such treatment. As they have no constitutional disturbance it does not seem that they require prolonged bodily rest at hospital or sanatorium. Some measure of local rest to the lung is provided by a pneumothorax, and it is not necessary to attempt complete collapse of the lung: a shallow pneumothorax sufficient to control and immobilize the diseased lung, partially or completely, is what is required, and it is suggested that the pneumothorax be maintained for not longer than two or three years, by which time, on the analogy of the tuberculous joints, it is hoped the lesion will have healed. A shallow pneumothorax for a slight lesion of the lung is unlikely to give rise to complications, and causes no discomfort or subjective incapacity.

Once the collapse is established daily supervision is not necessary, and, provided that the home conditions are good, the patient need only stay in hospital for a short period. Where the home is unsatisfactory, or the patient's general condition is below normal, a period in a sanatorium may be necessary. A number of our patients have returned to work or school without any ill effects a short time after the induction of the pneumothorax. If the infiltration is bilateral the position is unaltered and the treatment is the same. A shallow bilateral artificial pneumothorax is tolerated as easily as a unilateral one, and in the case with a unilateral artificial pneumothorax there should be no hesitation in inducing a bilateral artificial pneumothorax should a tuberculous deposit appear in the other lung.

Regular supervision is ensured by the weekly attendance for refills; and this is important, because without such a tie healthy young people will naturally tend to become less and less frequent in their attendance over a period of years.

Here, then, is a form of treatment which offers a reasonable prospect of cure without prolonged exile from normal life and work. We would emphasize that, as yet, it is impossible to assess its value, but we suggest it as a reasonable alternative to other methods in use which, in our experience, are unsatisfactory in their final results or are impracticable for the majority of patients.

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PERIPHERAL ARTERIAL EMBOLISM

BY

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The surgical treatment of embolic occlusion of a peripheral artery has been developing over a long time. In 1907 both Sampson Handley and Moynihan attempted to relieve the condition by operation. In this country little attention was paid to their efforts, but the Scandinavian surgeons, led by Einar Key, developed a satisfactory operative technique, and in 1925 Jefferson performed the first successful embolectomy in England.

The incidence of embolic occlusion it is impossible to assess, but, although the condition is not common, I believe many cases are missed. Griffiths (1938) reports 8 cases in a three-year period in Manchester; and in St. James's Hospital, Leeds, from 1936 to 1939, with approximately 28,000 admissions, there were 7 cases in 5 patients, all of which came under my care.

The embolus may arise from the pulmonary veins, a vegetation on the mitral valve, a mural thrombus of the left auricle, or an atheromatous plaque of the aorta; or from a systemic vein in the presence of a patent foramen ovale. The cardiac origin is by far the commonest, and is often associated with auricular fibrillation. It was the focus in all my cases. Emboli usually become impacted at the bifurcation of an artery, for it is here that the lumen is most suddenly reduced in size. Of 382 Swedish cases (quoted by Riddell, 1937) the embolus was located in the common femoral in 54%, in the common iliac in 17%, in the popliteal in 11%, in the upper limb in 12%, and in the aorta in 4.5%. The few cases operated on in England suggest about the same percentages, and in my series four of the emboli were impacted at the bifurcation of the common femoral artery, two in the popliteal, and one at the bifurcation of the aorta.

Diagnosis

Diagnosis is usually easy, and depends on pain, pallor, paralysis, and loss of arterial pulsation in a limb. It is reported that immediately the artery is occluded the patient complains of sudden severe pain, often located over the site of the embolus. This description is inaccurate, for although pain may be severe it may also be absent. None of my patients complained of severe pain and only four of slight pain. In the case of occlusion of the bifurcation of the aorta the operative findings indicated that most probably the blockage had been sudden and complete; for there was no secondary thrombus, and yet the patient did not complain of real pain but only of abdominal discomfort. Deitch (1936) speaks of "agonizing colicky pain," and Riddell of "intense agonizing pain." The intensity or absence of the pain therefore must not influence the diagnosis.

All my patients did complain of numbness and loss of use in the affected limb. In five in whom the incident occurred while they were in hospital undergoing treatment for auricular fibrillation it was the first complaint to be made to the ward sister. The circulation was probably impaired for a few minutes before nerve symptoms appeared. In a case of occlusion at the bifurcation of the common carotid Griffiths (1938) reports sudden contralateral hemiplegia. A general pallor with some blotchy cyanosis was observed in all the affected limbs and was present within a short time of the first complaint by the patient. The limbs felt colder than the normal, and the area of anaesthesia was of the stocking type but not reaching as high as the site of impaction.

There is always loss of arterial pulsation beyond the blockage, but this may be misleading in the case of obstruction at the bifurcation of the common femoral artery. The common femoral artery is 1½ in. long, and, to the unwary, palpable pulsation below Poupart's ligament may give the impression that the femoral arteries are patent and that the blockage is in the popliteal. I found that if a sphygmomanometer cuff was applied round the mid-thigh no oscillations in the mercury column were visible at any pressure in cases of femoral blockage, but that they were easily seen in cases of popliteal

blockage. A more accurate instrument is the Pachon oscillograph, but it is rarely available.

Whether this group of signs and symptoms occurs rapidly or slowly should not affect the diagnosis, which it is important to make as early as possible.

Leriche, Fontaine, and Frieh in 1933 urged the use of thorotrast in diagnosis and in localization of the embolus, but although this method may be very accurate I feel that it should be rarely necessary.

Treatment

Opinion regarding the best treatment varies from non-operative conservation to removal of the affected part of the artery. Leaving the patient may result in spontaneous recovery, or by chance the embolus moves into a side branch of the artery, but it is more likely that he will die rapidly or after the onset of gangrene. Murray (1936) has experience of 13 cases which were not operated upon; 8 of these patients died before the onset of gangrene, and the others afterwards.

Embolectomy is not universally favoured, the dissenters claiming that it does not restore circulation in a sufficiently large proportion of cases and that too many patients fail to survive. Strömbeck (1935) reviewed 327 operations and found that 63% of the patients died in hospital and only 12% survived for five years. In spite of the failures many cases are outstandingly successful. It is accepted that patients rarely die from the operative intervention; all my cases were suffering from auricular fibrillation, yet there was no operative mortality. The patient with aortic occlusion stood the operation surprisingly well; the circulation in his leg recovered, and he survived for several months. Another patient on whom I performed a femoral embolectomy was doing her full housework one year later. Embolectomy is rarely contraindicated by the poor condition of the patient, and if performed within six hours there is a reasonable chance of success, but if after twelve there is practically none. Surgeons are therefore very largely dependent upon the general practitioner and physician for the successful treatment of the condition.

Anaesthesia was induced by spinal percaine 1/200 for all except the aortic case, for which it seemed better to use the 1/1500 solution so as to make the Trendelenburg position safer. Local anaesthesia is efficient and safe, and is of particular value when operating on the brachial and subclavian arteries. A special advantage is that the patient can describe subjective sensations, which are useful in assessing any recovery of circulation during the operation.

Operative Technique

The affected artery is approached through one of the usual incisions, and I stress that the bifurcation of the femoral is more distal than often imagined. Recent opinion has been that an aortic embolus should be milked down from the bifurcation after retroperitoneal exposure and removed through a femoral artery previously prepared but temporarily closed distally by a rubber band. I approached the aorta transperitoneally and found no difficulty. There was no unusual distension of the gut, and the patient withstood the operation extremely well. This is, I believe, the tenth successful aortic embolectomy, and of these cases four have been approached transperitoneally.

The site of the embolus is located by the cessation of pulsation. A sling of rubber tubing is placed both proximal and distal to the embolus. The proximal one is rendered taut and an incision made in the artery over the embolus. This is gently lifted out, and it usually brings with it a length of secondary thrombus; in one femoral case 8 in. of thrombus was removed. If the distal band is made taut before this stage the secondary thrombus may be broken and part of it pass along to block the artery more distally; this I believe is an important point in technique. For the same reason I think an artery which is being opened distal to the embolus—for example, a femoral in a case of aortic occlusion—should not be lifted by the slings until it is seen to be free from secondary thrombus. I found suction applied through a Eustachian catheter passed into the artery useful in removing distal thrombus. If completely cleared there should be some bleeding from the distal end.

The distal sling is then lifted and the proximal one released, when the blood pressure is usually sufficient to clear this part of any remaining fragments. Then both slings are lifted, the wound is bathed in sodium citrate 3%, and the artery was quickly sutured with waxed Chinese silk size 0, the stitches passing down to but not through the intima. It is surprising how few stitches are required.

This was the technique followed in my cases, including the aortic, in which the slings were placed around the aorta and common iliacs while the incision was made just above the bifurcation.

If the distal circulation shows no signs of recovery within one hour a more distal exploration of the artery must be considered, but it should be remembered that circulation may improve without recovery of peripheral pulsation.

Other operations described for the relief include ligation of the artery above and below the incision after removal of the embolus, the intention being to prevent post-operative thrombosis. A more radical device is the excision of the affected part of the artery, it being maintained that complete section of the artery prevents spasms and tends to open up the collateral circulation.

I have no experience of the post-operative use of heparin, but it seems probable that this may prevent post-operative thrombosis in the affected vessel. The dosage recommended is 10 units of heparin to 1 c.cm. of saline given by intravenous drip at the rate of 25 to 30 drops a minute, or 1,500 units four-hourly if given intermittently.

Summary of Cases

Case 1.—Man aged 57, admitted Dec. 18, 1936, with auricular fibrillation and mild cardiac incompetence. Cardiac condition improved but fibrillation persisted. On March 6, 1937, there was a sudden onset of numbness without pain in right leg. Five hours later, when first seen by me, the signs of occlusion of the popliteal artery were typical. Under spinal anaesthesia an embolus was removed through the popliteal artery from the level of the adductor hiatus. No thrombus could be extracted from the distal point and there was no return of blood from it. The artery was closed, but the circulation did not recover and amputation became necessary. There may have been a more distal embolus or the thrombus may have broken away during the exposure of the artery. It might have been better to excise the affected portion of the artery, but the chance of recovery must have been remote.

Case 2.—Man aged 64, admitted Nov. 30, 1938, with auricular fibrillation, palpable liver, and basal pulmonary congestion. On Dec. 5 he developed a typical occlusion of the left femoral artery without any pain. The embolus with three inches of thrombus was removed under spinal anaesthesia three hours later, and the circulation of the limb recovered completely. On Dec. 9 the right popliteal artery became blocked and an embolus was removed from it. The circulation did not recover, and the next day he developed a paralysis of the right arm, followed in twelve hours by a hemiplegia, and he died. The terminal signs were probably due to a blockage with spreading thrombosis in the cerebral circulation. No necropsy was granted.

Case 3.—Woman aged 53; she had several transient attacks of pain and loss of use in the left leg and arm and right leg. Admitted Feb. 5, 1939, fourteen hours after the onset of pain and loss of use in right leg. Auricular fibrillation was present, but the only evidence of failure was albuminuria. A diagnosis of femoral block was made and an embolus was removed, but no thrombus could be extracted and there was no bleeding from the distal end. Gangrene developed, necessitating amputation. The cardiac condition then improved and she went home on April 6. On April 12 she was readmitted with a right femoral blockage of six hours' duration. An embolus with four inches of thrombus was removed. The circulation was almost normal after twelve hours, but became deficient again, with the development of gangrene. A rapidly increasing bacterial endocarditis appeared, and the patient died on May 4. No necropsy was granted, but I think a secondary thrombosis may have caused the failure in the second embolectomy.

Case 4.—Man aged 28, admitted April 5, 1939, because of dyspnoea, cough with blood-stained sputum, and oedema of feet. A diagnosis of auricular fibrillation with failure was made. He was given digoxin 0.25 mg. t.d.s., and his pulse, though still irregular, fell from 110 to 72. On April 13 he suddenly complained of numbness of both legs and a little abdominal discomfort. When seen one hour later there was a blotchy discoloration below the knees, with loss of use of both legs and anaesthesia of stocking type reaching almost to the knees, and no femoral pulsation. A diagnosis of occlusion at the bifurcation of the aorta was made. He was operated on under spinal percaine anaesthesia. The embolus was removed through the aorta, which was approached transperitoneally. There was no post-operative shock and the patient's condition remained good. The

circulation had recovered completely after two hours—i.e., four hours after the blockage—and full use of the legs was regained. His cardiac condition did not improve and he developed a subacute bacterial endocarditis, but he was lost sight of at the time of the forced hospital evacuation in Sept., 1939.

Case 5.—Woman aged 36, admitted April 12, 1939, with auricular fibrillation and slight cardiac failure. She was given small doses of digitalis, and on May 5 developed a right femoral occlusion with the typical signs and slight pain. She was operated on within four hours under spinal anaesthesia, and an embolus together with 8 in. of thrombus was removed. The circulation recovered perfectly and pulsation of the posterior tibial artery at the ankle could be felt after a few hours. She left hospital, and although still fibrillating was doing most of her housework one year later.

I wish to thank Dr. J. Dick, medical superintendent, St. James's Hospital, Leeds, at which hospital I was working, for permission to publish these cases.

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GLOBIN-ZINC-INSULIN: SOME EXPERIMENTS

BY

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The above new delayed-action insulin—a compound of ox globin, insulin, and a trace of zinc—is already on the market in America, where several articles (see Bibliography) have been published on its action on animals and use in diabetics. These reports seem to have been thought so favourable by the British manufacturers and authorities that I gather it is already licensed and may soon appear for sale. It has received no proper clinical trial in this country (not easy in wartime); but even were it proved to be more useful than protamine-zinc-insulin, it seems doubtful wisdom to introduce another new type of depot insulin without withdrawing the old, as this is sure to confuse clinical practice. Moreover, any real new merit in globin insulin is not apparent to me either from the published works or from the following trials of a supply kindly provided by the courtesy of Burroughs Wellcome and Co.

It is generally agreed that soluble insulin is strong but too short-lived in action, and P.Z.I. weak but prolonged and apt to cause serious hypoglycaemia at night if too large doses are given in an attempt to stop glycosuria after meals. It is hoped that G.Z.I. will be intermediate in action and, with one injection before breakfast, will act strongly and control sugar by day, especially in the afternoon, but will tail off and avoid hypoglycaemia at night, though retaining enough action to prevent a serious diabetic relapse before breakfast—a worthy ambition but a tall order for any one preparation. On the whole the publications and opinions expressed in America suggest that G.Z.I. has more action in lowering blood sugar from 4 to 12 hours after injection and less from 12 to 24 hours than P.Z.I. But a close study of the few detailed protocols published shows many irregularities and contradictions, and, when one discounts the bias in favour of something new, little real difference. I have substituted 20 to 40 units of G.Z.I. for P.Z.I. in 6 mild cases under hospital control, and my colleague Dr. Wilfrid Oakley has tried other cases, without being able to appreciate any difference on blood and urine tests. I have not compared a series of severe cases in this way, as the results from day to day on any depot insulin are so irregular as to make such a study valueless. But the accompanying table shows the results of what is probably the least erroneous clinical method—the effect of equal doses of different insulins on the fasting blood sugar of a severe diabetic followed for 24 hours without carbohydrate food.

A diabetic man aged 35, on insulin five years, feeble-minded but otherwise organically normal, was the subject. His insulin had varied from 40 to 50 units a day, and was kept at 20 and 16 units during the experimental period. Once a week the evening dose was omitted so that the patient was thoroughly diabetic next morning, and after two fasting blood-sugar estimations at 7 and 8 a.m. (a wise precaution) the same test dose, 32 units, of the different insulins was given. The effect on the blood and urine was followed two-hourly, later three-hourly, for 24 hours, during which time no carbohydrate food was given, but some protein—meat, bacon, etc.—was allowed, which I always find does not affect the blood sugar although it probably increases ketosis. The table shows the blood-sugar results and the ketonuria by Rothera's test—more informative than the glycosuria, which ran strictly parallel. The fasting blood sugars are at a fairly uniform level and the comparisons on the whole satisfactory, although some tests (the blood sugars mostly in duplicate) were lost. Perhaps the contrast would have been clearer with a larger test dose; but any risk of hypoglycaemia had to be avoided, as quite small restorative doses of sugar may raise the blood sugar considerably in such protamine experiments and completely spoil the curves.

It is clear that soluble insulin is much the most active, that neither G.Z.I. nor P.Z.I. gives any very active liberation of insulin during the 24 hours, and that there is no practical difference between the general trend of their action. G.Z.I. seems to come into action more quickly (4 to 6 hours after injection), but its maximum effect is shown at 15 to 18 hours—no different from P.Z.I., and still making the night the most likely time of hypoglycaemia.

There are other points against the present introduction of globin insulin which are more obvious from the clinical than from the laboratory angle. It is clear that its action is weak and that it will have to be supplemented, like P.Z.I., in many cases with soluble insulin. At present a large number of cases are treated with a mixed injection of P.Z.I. and soluble insulin, and we know that some of the soluble is converted by the excess of protamine. We do not know if G.Z.I. contains an excess of globin nor what is the result of mixing G.Z.I. and soluble; but this is of great practical importance, and now is the stage when the initial mistake made with P.Z.I. might be avoided. The manufacturers must know the problem of mixed injections, because I have urged them for years to try to produce a P.Z.I. *without* an excess of protamine (I gather it contains twice as much protamine as is necessary to precipitate the insulin) so that varying mixtures of P.Z.I. and soluble could be injected with more predictable results. Again, the fact that P.Z.I. is cloudy and soluble insulin clear is a great safeguard against mistakes between delayed-action and quick-

Time in Hours	Globin Insulin at I: 32 Units Globin		II: 32 Units Globin		III: 32 Units Globin		IV: 32 Units Globin		P.Z. Insulin V: 32 Units P.Z.I.		VI: 32 Units P.Z.I.		Soluble Insulin VII: 32 Units Soluble		VIII: 20 Units Soluble	
	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera	Blood Sugar (mg. %)	Urine Ketosis Rothera
7 a.m.	164	0	258	+++	263	+++	282	+++	233	—	278	+++	256	+++	265	+++
8 a.m.	260	Sl. tr.	Lost	—	278	+++	267	+++	233	+++	285	+++	241	+++	256	+++
2 hours	250	+	260	—	285	+++	260	+++	256	+++	282	+++	235	++	222	+++
4 ,,	260	++	215	—	217	+++	263	+++	256	+++	267	+++	180	++	177	+++
6 ,,	202	++	190	+++	210	+++	244	+++	250	+++	263	+++	137	++	145	++
8 ,,	210	—	210	—	Lost	+++	210	+++	256	+++	266	+++	91	Sl. tr.	204	+++
10 ,,	218	+++	183	+++	210	+++	—	+++	244	+++	278	+++	90	+		
12 ,,	206	+	183	+++	244	+++	227	+++	250	+++	259	+++	133	++		
15 ,,	167	Trace	167	+++	241	+++	215	+++	217	+++	218	+++				
18 ,,	194	+	194	+++	244	+++	169	+++	170	+++	190	+++				
21 ,,	190	0	213	++	244	+++	177	+++	187	+++	198	+++				
24 ,,	Not done	—	213	—	238	+++	220	+++	230	+++	200	+++				

acting insulins; but the new G.Z.I. is a water-clear solution—to my mind, a serious disadvantage. Mistakes between insulins are all too common at present, and I foresee far more if another depot insulin appears on the market, especially if indistinguishable from soluble except for its label. It is difficult for me to understand how a new preparation of such a potent drug as insulin can reach the stage of marketing without serious trial by, and consultation with, the clinicians who will use it. If there is no administrative mechanism for judging and controlling the marketing of new products by their value in practical treatment it ought to be created.

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FAUCIAL AND LABIAL DIPHTHERIA

BY

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Diphtheritic membrane is rarely observed externally on the lip, and the following case, which presents this unusual feature, is deemed worthy of record.

A girl aged 10 was admitted to hospital on Dec. 23, 1942. On the morning of Dec. 21 she had complained of a sore throat and malaise. During the evening of the same day, while chewing a piece of toffee, she inadvertently bit her lower lip. She had no recollection of her lip bleeding. On the morning of the 22nd Dr. Jamieson—her family doctor—was called in. Finding clinical evidence of faucial diphtheria, he took a throat swab, which was reported K.L.B.-positive next day, when she was sent to hospital. At the time of this examination Dr. Jamieson saw no evidence of labial membrane.

On admission the girl, who was rather undernourished and pale, was moderately ill. There were flea-bites and a few septic spots over her limbs and trunk. Immediately to the left of the midline on her lower lip was a patch of diphtheritic membrane. On eversion of the lip this appeared to be mainly on the upper and internal surfaces. It was quite discrete, oval in shape, and measured about 3/4 in. by 1/2 in. The membrane had a faint yellowish tinge and glistened. It was thicker in the middle than at the edges. There was a moderate amount of oedema of the underlying portion of the lip, with marked injection of the area immediately surrounding the membrane (see photograph). The tonsils were moderately enlarged and inflamed. Covering the right tonsil was a patch of membrane about 1/2 in. in diameter and a smaller patch was seen on the left tonsil. There was no appreciable fetor, and only moderate bilateral cervical lymphadenitis. An enlarged, slightly tender lymph gland was present in the submental triangle. Examination of the circulatory, respiratory, and central nervous systems revealed nothing abnormal. The left knee-joint was the seat of long-standing tuberculous disease.

Treatment.—50,000 units of diphtheria antitoxin were administered intramuscularly after a serum-sensitivity test which proved negative. Swabs were taken from both lip and throat; from each of these were isolated "gravis" type diphtheria bacilli The accompanying photograph was taken shortly after her admission to hospital.

Subsequent Progress.—The day following admission the membrane seemed rather thicker, while the edges began to curl away from the lip surface, so that it appeared even more discrete than previously. After this the process of separation continued by a gradual thinning of the membrane as if its surface were being slowly rubbed away, and at the same time by the separation of tiny flakes from the edges, so that the membrane appeared to shrink in extent and thickness simultaneously. That portion of the lip exposed after separation of the membrane was almost "red-raw," and at times a little blood oozed from the surface.

By Dec. 27 separation of faucial membrane was complete, but the labial membrane was still present, although only half its original size. On the 28th a small thin flake of membrane remained on the lower lip, and only slight local oedema was present. On the 31st there was no appreciable diminution in the size of this flake, and it did not disappear entirely until Jan. 2, 1943. The area of the lip affected showed no evidence of injury after complete separation of the membrane. At this time the only abnormalities revealed on clinical examination were occasional extrasystoles. The patient was allowed up on Jan. 12, and was discharged on the 26th.

Comment

In the literature one can find very little reference to labial membrane, apart from direct extension in cases of late severe faucial diphtheria. An authority of such wide experience as Goodall (1928) says: "The writer has twice seen membrane on the tongue, three times on the lips, twice on the floor of the mouth, and once on the gums." Reiche in 1914 (M.R.C., 1923) recorded 49 instances of lesions of the lips among 7,314 fatal cases of diphtheria in Hamburg.

There can be no doubt that in our case the deciding factor was trauma to the lip in the presence of an existing faucial infection. Yet it is evident that, in view of the girl's story that the wound did not bleed, the trauma could only have been slight. It would appear, then, that relatively slight damage to labial mucosa facilitated the inoculation of the bacilli, and it is therefore surprising that labial membrane is not more frequently seen. Carrying the analogy to the fauces, it seems not unreasonable to suppose that Klebs-Löffler bacilli may gain entry to the tonsillar epithelium by virtue of minute traumata—possibly as a result of swallowing solid foods. This supposition may be further borne out by the experience that diphtheria is not often seen in tonsillectomized subjects or even in people with very small tonsils, in whom the lack of prominence would be associated with less possibility of trauma.

Summary

A case of faucial and labial diphtheria is described in which the formation of labial membrane followed a slight injury to the lip. The subsequent progress is recorded. It is suggested, from a consideration of this case, that slight trauma to a tissue may readily facilitate the introduction of Klebs-Löffler bacilli.

I would like to express my gratitude to Detective McHugh of the Gateshead Police for the excellent photograph reproduced herewith; to the bacteriology department of the City Hospital for Infectious Diseases, Newcastle, for "typing" of the causative organisms; and to Dr. James Grant (medical superintendent of this hospital) for granting me permission to publish this case.

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SUCCESSFUL TREATMENT OF A CHRONIC PARATYPHOID CARRIER WITH SULPHAGUANIDINE

BY

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AND

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It is generally recognized that human beings are the only source of the causative organisms of the enteric fever group and that carriers play an important part in spreading these diseases. One would probably be justified in saying that most of the outbreaks of paratyphoid fever in this country during the last few years had their origin in carriers. Medical treatment of the carrier condition has been found of no avail, and nothing had arisen up to the outbreak of war to alter the conclusion reached by Browning (1933) and his colleagues that cholecystectomy or other surgical measures directed towards the gall-bladder alone hold any prospect of cure.

While sulphanilamide itself and its earlier derivatives had been found to have little therapeutic action on intestinal infections, the introduction by Marshall and his collaborators (1940) of sulphaguanidine with its high bacteriostatic activity and low absorption from the intestinal tract seemed to offer good chemotherapeutic possibilities. Very soon favourable results were reported in the treatment of bacillary dysentery, and it was the favourable impression one of us (H. L.) gained in the treatment of some minor outbreaks of Sonne dysentery that induced us to try this drug in a paratyphoid carrier in spite of the fact that sulphaguanidine had failed to cure dysentery carriers. The typhoid carrier whose cure had been reported by Levi and Willen (1941) was not a chronic carrier, and it is impossible to say whether sulphaguanidine played any part in it.

Case Record

Our patient, Mrs. F., aged 24, a wartime nurse in the E.M.S., contracted the disease while nursing a case of paratyphoid fever. The febrile period of the disease, which lasted for rather more than a month, started on Sept. 3, 1941. She made an uneventful recovery, but continued to excrete *Bact. paratyphosum* B in the stools. Cholecystectomy was performed on Jan. 2, 1942, but the result of this surgical intervention was disappointing, for the carrier state continued unabated.

In July, 1942, Mrs. F. moved into the area served by this laboratory, and after an examination of her faeces had shown profuse growth of *Bact. paratyphosum* B it was decided to try treatment with sulphaguanidine. The first course, which was begun on Aug. 3, consisted of 1.5 g. three times a day for three days, followed by 1.5 g. twice a day for two days—19.5 g. in all; the patient was ambulatory during treatment. It might be mentioned that owing to a misunderstanding the amount of sulphaguanidine received by the patient in this first course was only half that intended.

Several bacteriological examinations from Aug. 10 onwards proved entirely negative for paratyphoid bacilli until Aug. 27, when they started to reappear. At first their number was small and growth could be obtained only after enrichment in tetrathionate broth; but they gradually became more numerous, until finally *Bact. paratyphosum* B was again the prevailing organism on MacConkey and desoxycholate-citrate agar plates sown directly with the faeces.

Though the result of this first attempt fell short of our expectations the temporary disappearance of the infective organism, which had not previously been observed in this carrier, was so striking that we could only attribute it to the administration of the drug. Hoping that continued treatment might exercise a cumulative effect, the patient underwent a further course of sulphaguanidine treatment, which began on Sept. 22. On this occasion the patient, whose weight was approximately 9 st., received 50 g. in seven days. This time complete suppression of the paratyphoid bacilli did not occur, but their number was greatly reduced. A third course was started on Nov. 24, the same dose again being given.

Though all subsequent examinations proved negative for paratyphoid bacilli the patient was given a similar and final course in Jan., 1943. *Bact. paratyphosum* B was never again recovered in six further examinations (Jan. 14, Feb. 2, 16, March 5, April 9, and May 8), and the patient has been clear now for about six months.

Discussion

Can her carrier condition be considered cured? It is a well-known fact that carriers sometimes cease to excrete the infective organisms for periods of several months, and the failure to recover *Bact. paratyphosum* B from this patient's stools for six months would not by itself justify the conclusion that she has been cured. But we have been fortunate in having the collaboration of Dr. A. Felix of the Emergency Public Health Laboratory Service, whose investigations offer strong evidence of the cure of our patient's carrier state.

According to recent unpublished work by Felix a Vi agglutination test, similar to that employed in the examination of chronic typhoid carriers (Felix, 1938), is often an aid to the detection of chronic carriers of *Bact. paratyphosum* B. A steady or rising B Vi titre is suggestive of a probable chronic carrier state, whereas a decreasing B Vi titre in a carrier would indicate that the carrier state was only temporary. With Dr. Felix's consent we reproduce his findings and conclusion:

"The following readings were obtained in the various agglutination tests:

	9/9/42	15/3/43
B. paratyphosum B Vi ..	1:40 + ...	1:20 ±
" O ..	1:200 ±	1:100 ±
" H sp. ..	1:200 + ±	1:100 ±
Salmonella H group	1:100 + ...	1:50 +

"I think that this result indicates that Mrs. F. no longer harbours paratyphoid B bacilli—that is to say, her carrier condition has been cured."

In the summer of 1942, when we decided to give sulphaguanidine a trial in the treatment of our paratyphoid carrier, the recent American literature on the subject was not available in this country. Had we seen it, it is unlikely that we would have tried sulphaguanidine, as the result of a number of well-conducted trials in enteric carriers (Cutting and Robson, 1942; Watt and Peterson, 1942; Saphir, Baer, and Plotke, 1942) had been unconvincing. Those reported successes were restricted to a very few cases, and either the patients treated were not chronic carriers or the data published were not sufficient to allow of a decision on this important point (Hoagland, 1942). We know now also, from personal communications, that previous trials in this country were no more successful.

Before we try to find an explanation for the discrepancy between our own experience and the recent American findings we have to consider the effect of cholecystectomy on the carrier condition. It is known that the infective organisms can persist in the faeces for weeks or even months after the removal of the gall-bladder (Browning, 1933). Though there seems to be general agreement that the onset of the beneficial effect of this operation is not usually delayed beyond three months, Browning (1933) describes the case of a paratyphoid carrier who continued to excrete the specific bacilli for a period of 14 months after cholecystectomy before finally ceasing. Thus, in order to assess the part of sulphaguanidine treatment in the cure of our carrier we have to keep in mind that this occurred approximately nine months after cholecystectomy. But we think we have better evidence for the efficacy of the drug in our case.

As described above, the drug had an immediate and striking effect on the number of *Bact. paratyphosum* B excreted. It would seem unreasonable to suppose that this disappearance of the infective organism from the stools, which had never before been observed in this patient, was solely a late effect of cholecystectomy. Furthermore, after the first course of treatment the paratyphoid bacilli reappeared, to become just as numerous as before; only after two additional courses did they disappear definitely. And here our findings are in agreement with those of Cutting and Robson (1942), who also found a diminution and a temporary disappearance of *Bact. typhosum* in the faeces of a carrier after a course of sulphaguanidine.

We feel, therefore, that the success in the treatment of our chronic paratyphoid carrier was due to the cumulative effect of repeated courses of sulphaguanidine, and publish this case in the hope that others may succeed in reproducing our experience.

Our thanks are due to Dr. A. Felix for his collaboration, and to Prof. S. P. Bedson, Sector Pathologist, E.M.S., for his interest in this investigation.

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Medical Memoranda

Actinomycosis of the Tongue successfully Treated by Sulphonamides

The following case record may be considered interesting enough to merit publication.

In May, 1941, a farmer aged 59 had a fluctuating swelling in the substance of the tongue to the right of the middle line. It was aspirated and smears were sent to Dr. Eric Wordley, pathologist, Plymouth, who reported the presence of the ray fungus. The patient was given large doses of potassium iodide, but developed iodism so badly that the treatment had to be stopped after 10 days. He was then given three courses of sulphapyridine 4 g. daily for four days, with an interval of four days between each course. The swelling of the tongue was smaller after the aspiration, and it diminished still more under treatment. In Aug., 1941, it had disappeared and there was no palpable induration. In Sept., 1941, he had lobar pneumonia and again received sulphapyridine treatment for three days. His recovery was uneventful. Incidentally, he has had glycosuria for many years.

He was seen at intervals of six months, and now (May, 1943) the tongue remains normal. Except for the two upper canine teeth, which look healthy, he is edentulous and wears upper and lower dentures; it is therefore unlikely that the entry of infection was through a tooth socket. In the autumn of 1940 one of his bullocks had "wooden tongue," and there may have been direct hand-to-mouth infection from that source.

The medical department of Messrs. May and Baker kindly supplied me with copies of the more important published papers on the subject of treatment of actinomycosis by sulphonamides.

A. MCCLOY, M.B., B.Ch.

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Arteriovenous Aneurysm of Neck

The following remarkable case is thought worthy of being placed on record.

CASE RECORD

A soldier aged 25 reported sick with attacks of swelling of the neck for the past six years which recurred every few weeks and at times prevented his wearing a collar. Attacks were associated with malaise and an aching pain in the left side of the neck which radiated to the shoulders. Sometimes there was slight dyspnoea and wheeziness, and he felt faint and sweated freely. A small nodule above the left clavicle often enlarged and became tender in the attacks. Throbbing in the left side of the neck and a sense of suffocation were usually brought on by a change in the weather, especially if thunder was about.

On examination he was healthy in appearance, and of good general physique; there was a small scar just above the lower end of the right sternomastoid. Increased pulsation was visible on the left side of the neck, and a systolic thrill was palpable over an area 2 in. in diameter at the level of the thyroid cartilage. Slight expansile pulsation could be felt. A loud bruit, maximal in systole but extending throughout diastole, was heard over the area. The thyroid gland was just palpable. A small gland was felt above the outer third of the left clavicle. There were enlarged glands in both axillae, and the tip of the spleen was palpable. Further questioning elicited the following story:

Six years ago he was riding on the top of a loaded haycart. The man leading the horse foolishly ran the wheels out of the track and the cart heeled over at a precarious angle, throwing the patient into the air. He landed on the prongs of an upturned pitchfork, which transfixed his neck, entering on the right side and coming out at a slightly higher level on the left. He was intensely dyspnoeic, but his distress was relieved immediately the fork was withdrawn. There was little bleeding and the neck swelled greatly. At hospital he was given A.T.S. and the wounds were dressed without exploration or suture. After three days he was returned home. He spent the next two weeks resting, most of the time in bed. When helped to a sitting position he was fairly comfortable, but could not raise himself unaided. There was much bruising, but the swelling subsided in about a fortnight and he returned to work a week later. The symptoms of which he now complains started a few weeks later, and have continued without much change ever since.

Investigation in hospital revealed no radiological abnormality in the chest or neck, and barium swallow was normal. Direct laryngoscopy disclosed nothing unusual. While under observation he had several attacks of malaise, with pain and throbbing in the neck, and, during one of these, fever up to 101°; there was slight generalized glandular enlargement and the spleen was palpable. In this attack the W.B.C. numbered 10,425 per c.mm., 54% of them polymorphs and 37% lymphocytes. No other febrile attack occurred, and though there was increased pulsation on the left side of the neck no definite swelling could be made out. Blood culture on one occasion showed haemolytic *Staph. albus*, coagulase-negative, thought to be a contaminant. The sedimentation rate was normal. Biopsy of the supraclavicular gland showed no abnormality and was sterile on culture.

COMMENT

The nature of these attacks could not be elucidated, as operation was considered to be unjustified in view of the mildness of the observed attacks. The patient was given a full course of sulphathiazole, but it is doubtful if this influenced the condition. He gave a history of symptoms suggestive of fever in previous attacks, but it is uncertain if it was a usual accompaniment. The fever in hospital may have been due to a coincidental infection. It was considered possible, however, that an infective process was associated with an arteriovenous communication comparable to the infective endarteritis seen in cases of patent ductus arteriosus. Apart from one possible contaminated blood culture, however, the blood was repeatedly sterile. It would appear that an arteriovenous aneurysm involving probably the superior thyroid artery was the basic pathological condition, and that some transient disturbance of the circulation in this region, due perhaps to thrombosis or embolism, resulted in an engorgement of collateral vessels. This might explain the attacks of swelling of the neck.

I wish to thank Col. J. L. Hamilton for permission to publish this case, and Dr. R. Arden Jones for assistance in its preparation.

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Captain, R.A.M.C.

Intravenous Infusions in Infancy

The provision of adequate fluid is probably the most important therapeutic measure in infancy. In cases with persistent vomiting fluid must be given parenterally, and there are several methods from which to choose, the intravenous route being the method of fewest limitations. The following modification of the Spivek method has been found to be simple and rapid:

A splint is strapped to the lateral aspect of the foot and tied with tapes or bandages to the side and end of the cot. About 0.5 c.cm. of local anaesthetic (novocain or planocaine) is injected over the great saphenous vein, which, although it may not be seen or palpated, is constantly found lying anterior to the internal malleolus. A transverse incision about 1 c.cm. long is made anterior to the malleolus and the subcutaneous tissue exposed. A curved cutting or intestinal needle is inserted at one end of the incision and the point brought out at the other end. The concavity of the needle now contains the vein lying in the subcutaneous tissue. By holding the two ends of the needle between the left index finger and thumb the vein can be dissected out. When it has been isolated the curved needle is threaded with catgut and drawn through. By dividing the catgut at the needle two pieces are left lying under the vein. At this stage, before the vein is ligatured or opened, the drip apparatus should be set up and tested, because any delay later may cause clotting in the vein. An incision in the upper wall of the vein is made with fine scissors or a scalpel, and one ligature is tied distal to this incision. A blunt bevelled needle is inserted in the vein and tied in by means of the other ligature. The drip apparatus is connected to the needle and the flow started. The choice of fluid is a matter for the individual case. Often it is found that the fluid will not flow, particularly in very small or premature infants. The introduction of 10 to 20 c.cm. of saline under pressure from a syringe usually dilates the vein sufficiently to allow a free flow.

The advantages of this method are that it is quick, simple, and requires very few instruments, all of which can be found in any ward or doctor's bag. The instruments required for cutting down upon and entering the vein are a 1-c.cm. syringe, one scalpel, one curved needle, and a ligature (linen thread in an emergency). Aneurysm needle, dissecting forceps, conjunctiva tissue forceps, or even fine scissors are unnecessary.

It is important that the fluid should not be given too quickly. A simple rule is to infuse as much fluid intravenously as the infant would be given by mouth (2½ oz. per lb. body weight): 5 to 8 drops a minute from a drip chamber is equivalent to 15 to 25 oz. a day.

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REFERENCE

Spivek, M. L. (1935). *J. Pediat.*, **7**, 199.

Reviews

ESSENTIALS OF PATHOLOGY

Essentials of Pathology. By Lawrence W. Smith, M.D., and Edwin S. Gault, M.D. With a foreword by James Ewing, M.D. Second edition. (Pp. 904; illustrated. 55s.) New York and London: D. Appleton-Century Company.

The first edition of this book was, to a large extent, an experiment. To quote the foreword written by James Ewing, it was a serious attempt "to take the teaching of pathology out of the realm of abstract philosophy and make it an effective force in the professional equipment of the medical student." The method employed was to illustrate the basic text, which was that of a standard textbook, by the inclusion in it of carefully selected case histories complete with histological, clinical, and *x*-ray photographs. Almost every illustration in the book was therefore related not only to the text but to a clinical account of an actual case. In the first edition 295 case histories were fully recorded and lavishly illustrated. The authors anticipated that this treatment of the subject, which resulted in an expensive and rather cumbersome volume of 886 pages, would "unquestionably meet with severe criticism if not with actual outright opposition." The writer of this review, after reading the first edition, did not share the authors' fears. He is not surprised that it was "accorded a cordial welcome" and that a second edition was called for after so short an interval. The reasons are plain. Relatively few medical students are seriously attracted to pathology for its own sake; on the other hand, the majority are deeply interested in it so long as they can directly apply it to the solution of the diagnostic and prognostic problems presented by the living patients they examine and investigate. The traditional textbook of pathology tends to present the subject as a branch of biological knowledge established in its own right as a basic science, and this aspect is often strongly stressed. The business of correlating the academic pathology of the textbook with clinical observation is for the most part left to the student himself, and, as this book is the first serious attempt to help him materially in this very difficult task, it should meet with all the success it deserves.

The second edition has been considerably expanded. The first thirteen chapters have been completely rewritten; they deal fully and adequately with the principles of general pathology and greatly add to the value of the book. The number of case reports has been reduced by omitting those in which most of the clinical detail was irrelevant to the pathological condition under discussion. The whole text has been brought up to date in a very thorough manner. A useful bibliography has been added. The authors have been occasionally over-zealous in their effort to omit nothing of significance in modern research, and have included a few accounts of experimental work whose application to human pathology is doubtful or uncertain. Another minor criticism is the use of uniform type throughout the subject-matter of the book. The junior student reading pathology for the first time needs some guidance in distinguishing between commonly occurring diseases and those which are rare and curious: the use of small type for conditions in the latter category would be of material assistance.

COMPARATIVE TOPOGRAPHICAL ANATOMY

Topographical Anatomy of the Dog. By O. Charnock Bradley, M.D., D.Sc., F.R.C.V.S. Revised by Tom Grahame, F.R.C.V.S. Fourth edition. (Pp. 316; illustrated. 28s.) Edinburgh and London: Oliver and Boyd. 1943.

This book has been revised by Prof. Tom Grahame of the Royal (Dick) Veterinary College, Edinburgh, and it furnishes an admirable example of the high standard of efficiency which has been attained in the production of students' manuals of anatomy in the University of Edinburgh. The present edition has been in part rewritten; some excellent *x*-ray photographs and new diagrams have been introduced; and certain changes, involving more especially the nomenclature, have been made in the description of the lymphatic system. From the standpoint of comparative anatomy, textbooks illustrating the essential features in the anatomy of different types of domestic animals, such as the dog, are of great value, since they serve to register in a systematic way many points of both resemblance and difference in their anatomy as compared with that of the human subject, which, although well known to the veterinary profession, are less generally appreciated by those whose anatomical study has been limited to the human body. In comparing the anatomy of the domestic animals with that of the human subject the observer cannot fail to be impressed by the general similarity in structure between man and the domestic animals, while at the same time he notes modifications of the general plan which have been brought about by adaptation and heredity, and which in some cases have led to evolution, in others to regression. There is, for instance, the high development of the olfactory system in the dog, as compared with regression of this system in the human subject, in whom the small olfactory lobes are completely overlapped by the frontal segment of the brain, and the roots connecting these with the pyriform lobes are reduced to mere "striae," which name, although employed in veterinary anatomy, is quite inadequate to describe the conspicuous stout bands joining the olfactory lobes with the large pyriform lobes of the dog.

THE MENTAL PATIENT AT HOME

Mental Illness: A Guide for the Family. By Edith M. Stern, with the collaboration of Samuel W. Hamilton, M.D. (Pp. 134. $1.00 or 6s.) New York: The Commonwealth Fund; London: Oxford University Press. 1942.

The attitude of the patient's relatives to mental illness is one of the chronically difficult problems of practice, and anything that will help their understanding is very much to be welcomed. Miss E. M. Stern has written a small book which promises to be really helpful in this regard. The advice it contains is very good indeed, and although it is designed for American audiences it is equally applicable over here.

Miss Stern does not hesitate to be straightforwardly frank about the disadvantages of certain attitudes which relatives are apt to assume. She states, for example—although it is a bitter pill—that social conditions at home may adversely influence or even aggravate mental illness, and she explains why. This is the kind of home truth that may be more helpfully conveyed in a book than by word of mouth from the doctor, partly because of the public reverence for the printed word, and partly because what is written in a book cannot be so readily taken personally by any particular set of relatives.

The rest of her advice is equally sensible: for example, she is very sound on the folly, for those who can ill afford it, of spending a lot of money on a private mental home, when accommodation equally good, or better, can be found in a public one. There is also useful advice on that important phase in a patient's recovery, the period of convalescence at home; and the book ends with an appeal to the public to support legislation and public bodies seeking to improve the lot of the mentally sick.

Notes on Books

Dr. ELIZABETH HUNT'S book *Diseases Affecting the Vulva* was highly commended in these columns after its publication in 1940. The author, with very full knowledge gained in private and hospital practice, wrote it to meet the need of general practitioners and gynaecologists for a textbook on vulval disease from the dermatological point of view. A second edition has now appeared (Kimpton, 21s.), and in revising the text Dr. Hunt has taken note of suggestions coming from many quarters and has incorporated some new material. Her work, with its helpful coloured illustrations, fills a gap on the medical bookshelf; it co-ordinates many observations scattered through specialized literature, and brings the whole subject to a focus in the light of much personal experience and study.

A Handbook of Modern Physiology, by R. K. PAL and A. CHAKRAVARTI, is an entirely Indian production and is intended especially for the use of Indian students. The authors are to be congratulated on the fruit of their labours; it is clearly written and up to date. The special paragraphs on applied physiology are well suited as links with clinical studies, and in the appendix is given the composition of Indian articles of diet: The printing and blockwork are above usual Indian standards. We predict a long and useful life for this book, of which the second edition is published in Calcutta by the Book Company Ltd. at the price of Rs. 12.8.

The Year Book Publishers of Chicago have informed their London agents, H. K. Lewis and Co., that the only 1942 volume of the series now obtainable is that on *Physical Therapy*.

DELOUSING OF CLOTHING BY FUMIGATION

BY

W. A. L. DAVID

(London School of Hygiene and Tropical Medicine)

Among the methods used for disinfesting clothing and bedding during the last war heat and steam treatment took the first place, followed by fumigation. The latter method came into special importance after the end of the war, when large quantities of hydrogen cyanide were used for disinfestation work in Central Europe. The present war has seen the further development of the application of heat and steam and also of insecticidal sprays and dusts for louse control. At the same time it seemed desirable to gain further knowledge concerning control by fumigation and to search for substitutes for hydrogen cyanide. As a method of treating bedding and clothing, cyanide fumigation has the great disadvantage that the materials treated absorb large quantities of the fumigant, which may be given off later in dangerous amounts when the articles are brought into a warm room or are worn. Only very careful airing can guard against this risk, which is so serious as to warrant the development of special measures for detecting cyanide residues. Further, fumigation with cyanide is a job which only an expert can carry out. The need for an alternative fumigant is therefore apparent.

With the above purpose in mind twenty materials were submitted to preliminary tests, and of these seven have been given practical trials: they are ethylene oxide, methyl formate, ethyl formate, ethylene dichloride, methyl-allyl chloride, trichloracetonitrile, and chloropicrin. Each of these has its advantages and disadvantages.

Before deciding upon a fumigant it is necessary to know something of the circumstances in which it has to be used and the purpose for which it is intended. For example, if only the clothes of one individual are concerned it may be considered desirable to apply a quick while-you-wait treatment, or to supply a dose of fumigant which can be applied by the individual in his own home. On the other hand, a large group of people who must be simultaneously disinfested if they are not to reinfect one another require a special chamber operated by experienced personnel, and in this case there is not the same objection to a toxic fumigant.

Small-scale Methods

Since at present the problem is usually one of dealing with a strictly limited volume of infested clothing, only the small-scale methods and doses will be described here, leaving the description of the full-scale technique to be published later.

The method of disinfestation described below should be suitable for several purposes. It could be applied to the clothes of a lousy person admitted to any institution, such as a hospital, workhouse, or any place providing casual beds. It could be applied to their working overalls between periods of duty by any group of people working in a typhus area. Or, again, any person could use this method to disinfest his own clothing without recourse to special apparatus.

For the purpose of the actual tests carried out, an ordinary ash-bin, 2 ft. high and 1¼ ft. in diameter, volume 3.7 c.ft., was employed, but any reasonably airtight tin box, chest, or trunk would be satisfactory. The garments to be fumigated are collected conveniently at hand and placed one by one into the chosen fumigation enclosure. A little of the fumigant is sprinkled on each or every other garment, taking care that it is evenly dispersed throughout the whole mass of clothing and, if anything, keeping rather more than half the total volume for the upper part of the chamber, since the vapour tends to sink to the bottom. The clothes may be packed in quite tightly. A very satisfactory sprinkler for the fumigant can be improvised from any small bottle with a metal screw top in which a few holes have been punctured. As soon as the bin or other enclosure is filled the lid is closed down and the whole is allowed to remain for the full period prescribed. At the end of the period (there is no harm in waiting a little longer, if convenient) the garments are removed and shaken to assist airing, which is complete under most conditions in about 10 minutes.

Results

Of the seven fumigants mentioned, three proved to be especially suitable for the above purpose. They are methyl formate and ethyl formate (Boake A. Roberts) and methyl-allyl chloride (Drake Law Laboratories). The two formates are both inflammable liquids of a very low order of toxicity to man, and can be handled with safety by anyone capable of handling petrol. At the same time they give a 100% kill of lice and eggs with a 1-hr. exposure period. Of the two, ethyl formate is slightly more toxic; but methyl formate is quicker in action, cheaper, and more easily available.

Methyl-allyl chloride (or methallyl chloride) is also inflammable, and more toxic to man. It has about the same order of toxicity as carbon disulphide, but is much less inflammable. The small quantities necessary for a bin fumigation could be safely handled by anyone exercising the minimum amount of care, especially in a well-ventilated room or out of doors. Above 20° C. it is much more effective, volume for volume, than either of the formates.

The circumstances in which the above fumigants will give 100% kill of all stages of the body louse, including eggs, are set out in the following table. The assumption is made that the enclosure used is at least as airtight as an ash-bin, and this should be very easy to attain.

Fumigant	Exposure Conditions					
	1 Hour		2 Hours		5 Hours	
	10° C.	20° C.	10° C.	20° C.	10° C.	20° C.
Methyl formate:						
mg./lit.	1,290	1,010	920	735	645	460
c.cm./c.ft.	38	30	27	22	19	14
Ethyl formate:						
mg./lit.	965	790	790	615	352	264
c.cm./c.ft.	30	24	24	19	11	8
Methyl-allyl chloride:						
mg./lit.	1,320	615	1,055	264	264	176
c.cm./c.ft.	41	19	33	8	8	6

The dosages in the above table are given in mg. per litre (=oz. per 1,000 c.ft.), followed by c.cm. per c.ft. air space, which is convenient as a practical measure. For prevailing temperatures of from 10° to 20° C. the dose given in the 10° C. column should be employed; for temperatures above 20° C. use the dose recommended for 20° C.

So far as is known none of the fumigants damages clothing under the condition of fumigation recommended, but in a mixed collection of articles any which are of delicate texture or of a colour likely to fade can be very largely protected by avoiding sprinkling them with the fumigant directly.

Cost

Finally, an indication of the cost of the treatment is relevant. This is somewhat difficult to assess, since the cost of the fumigant varies with the amount supplied, being appreciably less for quantities in bulk. As an approximate indication it may be given at something between 1d. per bin of 3.7 c.ft. for methyl formate with a 5-hr. exposure to about 8d. per bin with methyl-allyl chloride using a 1-hr. exposure. Taken all round, the 2-hr. exposure at 20° C. is most economical in time and money.

This work was carried out during the tenure of a grant from the Medical Research Council.

After July 25 the expectant mothers' clothing book will be issued by the local food office where the mother is registered, instead of by the public health department of the local authority for maternity and child welfare. The book, containing 60 coupons, will be issued at the same time as the unborn child's food book, thereby avoiding the necessity of the mother having to produce another medical certificate. The coupons can be used as soon as the book is issued. The child's food book will contain a clothing book with a number of coupons for use between the child's birth and the end of the rationing period in which it is born. This means that instead of getting the child's clothing book after birth, the expectant mother will be issued with it in advance. But the child's clothing book must not be used until the child has been born and registered, and its name, address, and identity card number have been written on the cover.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY JULY 24 1943

REFORM OF THE HEALTH SERVICES

Among contributions to the literature of medical planning exceptional interest attaches to a booklet prepared for the Nuffield College Social Reconstruction Survey by Sir Arthur MacNalty.[1] Medical reform is here dealt with by one who has seen its problems from the high observation post of Chief Medical Officer of the Ministry of Health, but is now free in retirement to speak his mind as freely as he may think it wise to do. Naturally, coming from one with long experience of the cross currents in administrative and medical channels, the reforms suggested are not ideal measures of public health reform, but they are measures, Sir Arthur believes, which, having regard to possible post-war conditions and a multitude of conflicting interests, are practicable and might go far to reconcile differences of opinion. At the outset it is made clear that, in spite of defects of organization, medical science is making rapid progress and the public is benefiting thereby. Development should therefore be along well-established lines and not by entirely new creation. Great emphasis is placed upon better teaching of medical students in the preventive aspects of medicine, a wider dissemination of knowledge among the people, and greater public appreciation of the need, and provision, for nutrition, fresh air and sunlight, healthful recreation and exercise, and reasonable hours of work and study. On the administrative side Sir Arthur is of opinion that the health services should be a function of local government and that the central authority should exercise less detailed control over the actions of local authorities than is now customary. It should direct, supervise, inspect, and subsidize. The Ministry of Health should be recognized as the paramount central health authority, co-ordinating through an inter-departmental committee the health activities of all other central Government Departments, whose medical sections might be housed in the Ministry of Health. There would also be a medical advisory committee the constitution of which is not specified. Tentatively it is suggested that a department of health with a non-political head would make for efficiency and acceleration of reform. Consideration should at least be given to reducing the influence of politics to a minimum and to more stable tenure of office by the presiding Minister of Health. Sir Arthur advocates a Regional Health Council as the co-ordinating, or preferably executive, local body. It would be appointed by the county and county borough councils of the administrative areas included in the region. Some representatives of voluntary hospitals and other important voluntary bodies would "serve" on it, but their mode of access to it is not described. It would have subcommittees responsible for subdivisions of the health services. On medical matters it would be advised by a medical advisory committee which would consist of the county and county borough medical officers of health and the chief medical officers of the different branches of the health services, but, in addition, it would include representatives of the medical staffs of voluntary hospitals, the B.M.A., and a certain number of leading medical men resident in the area.

For the rest, Sir Arthur's scheme follows fairly familiar lines. Health insurance would extend to dependants and embrace hospital treatment, laboratory, consultant, and specialist services based on hospitals. Those in the higher income ranges would be, in the first instance, voluntary contributors. Insurance committees would be abolished and their functions transferred to (apparently the existing) local authorities. Voluntary hospitals would continue to manage their own affairs, being paid for services rendered and in special circumstances receiving grants from the Regional Council. On the other hand the local authorities would delegate their responsibilities to the new councils, although this proposal is realized to involve difficulties. The scheme would seem to envisage the possibility that Regional Councils might be mainly co-ordinating and grant-allocating bodies, although this scarcely accords with the tentative financial proposal that the money "raised" by local authorities, which Sir Arthur contemplates as the main source of income, would be pooled and used to meet the health needs of the region.

In this plan the health centre figures very prominently. Indeed it is regarded as of greater importance for the future of medicine than the hospital. "The dictum that future health services must be based upon the hospitals is somewhat misleading. . . . The prevention of disease, the paramount consideration, is better effected in the health centre or through advice given in the home." The advantage of such centres is the opportunity they afford for bringing together the general practitioner, the public health medical officer, the district nurse, the health visitor, and the midwife, and furnishing them economically with the clerical help and ancillary aids they require. Sir Arthur MacNalty is vague as to the terms of employment of medical practitioners in his scheme. At one place he indicates that payment would be made to the doctor on a capitation basis; in another he says that the earnings of the medical profession will be derived in increasing proportion from salary and in decreasing proportion from fees, and leaves it at that.

From this imperfect summary of his proposals it will be seen that Sir Arthur MacNalty accepts as proper and inevitable local governance of medicine by a body of the character of a local authority as at present understood, influenced in its operations by an advisory body of higher salaried officers. He must be well aware that a very great proportion of the money spent on local government is not "raised" by local authorities but comes from the central exchequer, that the Beveridge plan provides for some £40 millions of new money to be gathered from insurance contributions, and that the Government is committed by Section 135 of the Local Government Act, 1929, to contribute to any additional expense arising from the imposition of new duties on local authorities. A return to the pure milk of the nineteenth century principles of local government is unthinkable, and would be resisted by no one more vigorously than the local authorities themselves. This slow revolution in finance should have its influence on our ideas about local management. Clearly, if the cost of medical services is to be borne by State and local exchequers, the taxpayers and the ratepayers must have the last word in determining the nature and conduct of these services. But the nature of the managing body should not be determined by reference to time-worn shibboleths about the meaning and forms of democracy.

[1] *The Reform of the Public Health Services.* By Sir Arthur S. MacNalty, K.C.B. Oxford University Press. 1943. (2s. 6d.)

THE ARIBOFLAVINOSIS SYNDROME

It is now four and a half years since Sebrell and Butler[1] first described the facial lesions of a new syndrome associated with ariboflavinosis, or riboflavin deficiency. They described the bilateral transverse fissures in the angles of the mouth (the perlèche of previous writers), the red shiny lips, and the fine scaly, greasy desquamation around the nasolabial folds, said to be characteristic of the condition. Sebrell and Butler produced these manifestations in women in an institution given a diet complete in all respects but lacking riboflavin. When this was administered later the lesions cleared up. The existence of ariboflavinosis was confirmed in China by Hou[2] and in America by Jolliffe,[3] Spies,[4] and Sydenstricker.[5] To the appearances described by Sebrell and Butler, Kruse and his colleagues[6 7 8] added a specific type of glossitis and characteristic ocular manifestations. The tongue was described as clean, the papillae flattened and mushroom-shaped, and the colour purplish red or magenta in comparison with the scarlet tongue seen in some pellagrins. The ocular lesion ascribed to riboflavin deficiency was a superficial vascularizing keratitis, characterized on slit-lamp examination by circumcorneal injection, invasion of the cornea by capillaries from the limbic plexus, and superficial corneal opacities, the lesion being manifested subjectively by dimness of vision, photophobia, lacrimation, and burning of the eyes. Later Métivier[9] described further ocular lesions, which she thought were due to riboflavin deficiency because they responded to treatment with this vitamin. One she calls tropical nutritional amblyopia, which appears to be the nutritional retrobulbar neuritis of other writers, and the other essential corneal epithelial dystrophy. Métivier claims that this is a new eye disease characterized by a faint greyish-white disturbance in the corneal epithelium, made up of fine points like dots and commas, and staining with fluorescein. She also describes a form of conjunctival injection which she calls "rosy eyes," characterized by an apple-pink injection of the ocular conjunctiva exposed in the intrapalpebral area.

Later investigations have shown that certain of the manifestations originally stated to occur in the ariboflavinosis syndrome are not always associated with riboflavin deficiency; at all events they do not invariably respond to treatment with riboflavin. Thus cheilosis may occur independently of ariboflavinosis. Ill-fitting dentures, resulting in malocclusion, have been reported by Ellenberg and Pollack[10] as a factor in its causation. The cases described by these authors failed to clear up when given riboflavin, but did so when the malocclusion was corrected. This observation appears to be valid and has been reported by others.[11] Cheilosis has been observed in a case of post-encephalitic Parkinsonism receiving a normal diet; the salivation may have been responsible here. There is also some evidence that cheilosis may be associated with such diverse conditions as hypochromic anaemia[12] and sensitivity to lipstick and chewing-gum. Machella and McDonald[13] have failed to cure a number of cases of cheilosis with riboflavin. Some responded to nicotinic acid, pyridoxine, and the entire vitamin B complex. There are cases which resist vitamin therapy of any type. Some of the other lesions attributed to riboflavin deficiency are also apparently non-specific. Thus Smith[14] states that the seborrhoeic facial lesions described by Sebrell and Butler do not yield to riboflavin therapy, but respond to nicotinic acid slowly and to yeast rapidly. Machella and McDonald[13] have also failed to improve patients with the tongue lesions said to be characteristic of ariboflavinosis by administering riboflavin, though pyridoxine and yeast were curative in some cases. The corneal vascularization described by Kruse and his colleagues,[6 7] and employed by him in survey work as pathognomonic of ariboflavinosis,[15] has been shown by Sandstead[16] to be quite non-specific and present in from 80% to 95% of children, youths, and adults examined, and without any other signs of ariboflavinosis. Sydenstricker and Kruse[7] also described circumcorneal injection as an early sign of ariboflavinosis, but Scarborough[17] has shown that this is also non-specific, because it occurred in some 30% of unselected hospital out-patients seen by him and with no other signs or history of ariboflavinosis. Boehrer and his co-workers[18] placed three volunteers on a diet low in riboflavin (0.471 mg. daily) but adequate in other essentials, and failed to observe any signs of corneal vascularization after five weeks. Yet this appeared in a control subject receiving 3.5 mg. of riboflavin daily. The vascularization persisted even after three weeks on a "normal" diet and a further fortnight's treatment with 9 mg. of riboflavin daily.

Our conception of ariboflavinosis may need considerable modification when the results of investigations being carried out in this country and America are known. Experimental studies indicate that there is an individual variation in the requirement of riboflavin, independent of body weight and other known factors. Lack of balance in a diet may also produce manifestations of ariboflavinosis even on a high intake. Some other factor or factors may also be essential for the proper utilization of riboflavin. Thus Spies and his co-workers[19] have emphasized the roles of pyridoxine and pantothenic acid in its mobilization and utilization. It may be that a deficiency of other factors of the vitamin B complex, such as choline, inositol, and adenylic acid, complicates the so-called ariboflavinosis syndrome. It must also be borne in mind that the staple diet of the cases described in America was maize; in this country, where ariboflavinosis is rarely described, it is wheat. Does deficiency of an essential amino-acid play a part? These problems await solution.

1 *Publ. Hlth. Rep.*, Wash., 1938, **53**, 2282; 1939, **54**, 2121.
2 *Chinese med. J.*, 1940, **58**, 616; 1941, **59**, 314; *J. clin. Invest.*, Shanghai, 1941, **6**, 19.
3 *New Engl. J. Med.*, 1939, **221**, 921.
4 *J. Amer. med. Ass.*, 1939, **113**, 931.
5 Ibid., p. 1698.
6 *Publ. Hlth. Rep.*, Wash., 1940, **55**, 157.
7 *J. Amer. med. Ass.*, 1940, **114**, 2437.
8 *South. med. J.*, 1941, **34**, 165.
9 *Amer. J. Ophthal.*, 1941, **24**, 1265.
10 *J. Amer. med. Ass.*, 1942, **119**, 790.
11 *Med. Clin. N. Amer.*, 1943, **27**, 405.
12 *Medicine*, 1937, **16**, 267.
13 *Amer. J. med. Sci.*, 1942, **203**, 114; 1943, **205**, 214.
14 *J. Invest. Dermat.*, 1941, **4**, 23.
15 *Milbank Mem. Fund Quart.*, 1941, **19**, 241.
16 *Publ. Hlth. Rep.*, Wash., 1942, **57**, 1821.
17 *British Medical Journal*, 1942, **2**, 601.
18 *Amer. J. med. Sci.*, 1943, **205**, 544.
19 *J. Amer. med. Ass.*, 1940, **115**, 523.
20 *Klin. Wschr.*, 1942, **21**, 245.

NERVOUS SHOCK

That powerful emotions are associated with physiological changes and widespread bodily sensations is a commonplace. That these, though ordinarily transient and trivial, may be lasting and severe is a phenomenon dimly recognized in popular speech—in such familiar phrases as "he nearly died of fright" or "she fainted for joy." The qualifying adverb is, however, rarely omitted. Historical instances abound, but here the pathology must be interpreted with caution. Scientific support for the fatal effects of emotion is rarely forthcoming. Particular interest therefore attaches to a case reported recently by Stürup.[20] A woman of 35 was admitted to the psychiatric clinic in Copenhagen in a state of stupor. There was a history of earlier paranoid symptoms, and, although the diagnosis made was that of a psychogenic paranoid psychosis, the history suggests schizophrenia. She was treated with insulin

without success. Cardiazol was impracticable as the veins were difficult of access. After a few months this drug was given, but without avail. The patient was then still in stupor interrupted by accesses of rage. Five minutes after witnessing a violent outburst of rage by another patient she became short of breath, poured forth a flood of speech, said she had had a "shock," and could not be pacified. She showed the clinical signs of shock, with imperceptible pulse, chilly extremities, and a rising rectal temperature. Six hours later a blood transfusion was attempted, but failed because a vein could not be found in the cubital fossa. The patient was analgesic; no bleeding took place from the severed skin, and even section of the radial artery yielded only one drop of blood. It was impossible even under pressure to inject any fluid into the distal portion of the artery. A later attempt on the femoral vein showed it to be about the thickness of a knitting needle and whitish. Fluid was, however, injected with transitory improvement in the patient's condition; the analgesia disappeared, but 16 hours after the onset of the shock symptoms the patient died. Necropsy revealed much oedema of the lungs with stasis and haemorrhages and scattered bronchopneumonic patches. There were fragmentation of the myocardium, stasis in the kidneys and liver, and evidence of cerebral oedema but no stasis in the cerebral vessels.

Stürup discusses earlier work of his concerning the effect of painful stimuli on limb volume. He reached the conclusion that such stimuli induced peripheral vasoconstriction by creating a state of increased alertness to danger, and explained the subsidence of the reaction noted on repetition of the stimulus as due to loss of its "alarm character." He thinks this state may be the nervous precursor of Cannon's "emergency reaction," which appears when real danger threatens. He believes it justifiable on the basis of this work to assume a similar mechanism in the patient described, terror leading to peripheral vasoconstriction with diminished loss of heat and hence raised internal temperature. He alludes to the febrile episodes in psychotics which occur notably after hallucinations of strongly anxious character, and stresses the initial signs of terror in his patient. He has observed similar states in puerperal confusions, and mentions the value of insulin in suitable doses as a life-saving measure in these cases. He believes that several of the cases reported by Scheid some years ago belong to this group. Stürup considers that such states as that described can occur in mentally normal people in response to violent emotions where an over-sensitivity of the vegetative nervous system can be postulated. He also thinks that so-called "surgical shock" may arise in a similar way in cases in which fear and loss of blood have produced the necessary sensitivity of the vegetative nervous system, and indicates the necessity for prompt treatment. Be that as it may, such states of "shock" are by no means uncommon in schizophrenics, and for this an adequate explanation is still awaited. It might also be expected that in these days such states as Stürup describes would be seen with some frequency, but so far they do not appear to have been recorded.

TREATMENT OF EYES INJURED BY MUSTARD GAS

We are indebted to Mr. A. F. MacCallan for recalling that in Sept., 1918, at a French military hospital in France Dr. G. Bonnefon,[1] the only ophthalmic surgeon there, without medical assistance and without specially trained medical orderlies, had to treat 1,800 men in whom both eyes had been affected during a mustard-gas attack. These were treated at the rate of 200 eyes an hour according to the method to be described and contrary to the official instructions of the Service de Santé. The principle of the treatment consists in osmotic drainage of the affected mucous membrane by means of an eye-bath filled with hypertonic solution.

The clinical picture of the eye injured by mustard gas has three distinct phases: phase of impregnation, acute phase, and phase of recovery. The phase of onset is without symptoms, the eye exposed to blister gas allowing itself to become impregnated without manifesting any pain or discomfort. This lasts from one to three hours. The acute phase begins suddenly with hypersecretion of the conjunctival and lacrimal glands. Stabbing pain accompanied by photophobia begins, and in a few minutes the clinical picture is completed by such oedema of the eyelids as to close the palpebral fissure. The eye is now almost exactly like that of an infant with gonococcal ophthalmia neonatorum, except that there is no purulent discharge. When it is possible to open the palpebral fissure a yellowish blistering fluid spurts out. This phase lasts from two to five days, but may be shortened by judicious treatment. The phase of recovery is characterized by a progressive diminution of the palpebral oedema, but the lacrimal secretion and photophobia persist, with marked dilatation of the submucous capillary network. This phase may last for weeks or months in severe cases. Sometimes secondary infections of the conjunctiva or cornea occur, but these have no direct relation to the blistering action of the gas, which has long disappeared. Further skilled treatment by an ophthalmic surgeon may shorten or prevent this phase of sequelae.

The mildness of the ocular lesions caused by blistering gases as compared with their destructive effect on other parts of the body is indisputable. In contact with the tissues mustard gas (dichlorethyl sulphide) undergoes hydration with formation of hydrochloric acid. Severe pain is experienced and the defensive mechanism of the body is brought into play. No organ is more exposed or better protected than the eye. There are the reflex flow of tears, which clears away the acid from the conjunctival fornices and from the ducts of the meibomian glands; osmotic action, which fills up the subepithelial lymph spaces; dialysis of fluid from the submucous capillaries. This superficial and deep lavage prevents any eruption of blisters. In 1917 Bonnefon saw, in the narrow valley of Belrupt near Verdun, a battery of horse artillery which had been shelled with mustard gas the day before. A number of the horses exhibited absolutely opaque corneae as a result of the gas, while none of the gunners had to be sent to hospital, though some of them had not been wearing their masks. He observes that the horse and the rabbit have no lacrimal secretion or periocular lymphatic defences which in man render the eyes less liable to damage by gas. It is therefore reasonable to conclude that, since the natural defences of the ocular adnexa suffice to protect human eyes when slightly damaged by gas, in severe cases the aim should be to reinforce the natural mechanism. Bonnefon carried this out after another heavier gas attack, as soon as the casualties arrived at the first-aid post, by cleaning up the eyelashes and applying an eye-bath filled with a warm hypertonic lotion. This consisted of saturated solution of sodium sulphate 800 grammes (about 1½ pints) and syrupus simplex 200 grammes (about 1/3 pint). However great may be the palpebral oedema, this solution enters the palpebral fissure and penetrates to the fornices and osmotic drainage occurs. After ten minutes of immersion the fluid in the eye-bath becomes acid, proving the efficacy of the treatment. With 200 eye-baths and four first-aid assistants, 1,500 eyes were bathed twice a day. This osmotic treatment should be continued not only during

1 "L'Œil ypérité: Son Traitement." *Gaz. hebd. Sci. méd.*, 1939, **60**, 168, 179.

the acute stage, but also so long as there is any photophobia and lacrimation. When an analgesic is needed Bonnefon recommends the instillation of a 2% solution of dionine (ethyl morphine).

The treatment for gassed eye given in the official *Medical Manual of Chemical Warfare*, 1943, pp. 16 and 19, envisages the flushing of the conjunctival sac with water if this can be done within five minutes, the instillation of atropine as a mydriatic and of albucid soluble 2.5% as an antiseptic. If the discharge is excessive the conjunctival sac may be washed out with normal saline solution twice a day. Cocaine must never be used as an analgesic as it will cause damage to the corneal epithelium. Liquid paraffin and oily drops must never be used while there is a possibility of any dichlorethyl sulphide remaining in the conjunctival sac, because they are solvents thereof and further damage may be done. Mr. MacCallan's criticism of this treatment is that if atropine is used as a routine for slight casualties the recipient will be out of action for a week or longer, while in a case of only moderate severity one cannot introduce a satisfactory amount of irrigation fluid into the conjunctival sac on account of the tight closure of the lids.

ALCOHOL AND THE BRAIN

From the dawn of history man has used the depressant action of alcohol on the cerebral cortex and its effect in releasing the lower centres as an aid to conviviality in social intercourse, and as an escape from the tension and drabness of his everyday life. Alcohol depresses those parts of the brain the functions of which are chiefly inhibitory, so that the power of restraining the emotions is impaired. What happens to the alcohol that has loosened the tongue of the after-dinner speaker or has produced oblivion in the habitual toper? Little is known of the way in which it disappears from the brain. It was always thought to be metabolized in the tissues and not in the central nervous system, which was supposed to metabolize carbohydrate only. Enough evidence has now accumulated to show that alcohol is oxidized by the cells of the central nervous system. Alcoholized brain tissue takes up more oxygen than normally respiring brain tissue,[1] and as the respiratory quotient of the tissue shifts towards that of alcohol it may be assumed that the increased oxygen consumption is concerned with the metabolism of the alcohol.[2] However, in acute alcoholism there is a diminution in the cerebral oxygen consumption, due to the depressant action of large quantities of the drug.[3] The presence of an alcohol-oxidizing enzyme system in the brain of several species has now been demonstrated by Dewan[4] of Ontario, and it may be assumed that a similar mechanism exists in the brain of man. Two members of the vitamin B complex —namely, nicotinic acid and riboflavin—are components of this system. As this catalyses the consumption of alcohol in the brain, and as alcohol is known to depress the functioning of the latter, Dewan suggests that this enzyme system probably acts as a detoxicating or protective device after excessive alcoholic indulgence. It is well known that alcoholics eat sparingly and suffer from vitamin deficiencies, particularly of the vitamin B complex. Owing to the relative deficiency of nicotinic acid and riboflavin in such persons alcohol may reach a high concentration and remain for a long period unmetabolized in their central nervous system. It would therefore appear essential to increase the intake of nicotinic acid and riboflavin not only in the chronic alcoholic but also in the heavy drinker, to ensure efficient removal of alcohol from the nervous system. As Dewan points out, the fact that the brain is equipped to metabolize alcohol indicates that the central nervous system is more versatile chemically than we thought.

1 *Arch. Neurol. Psychiat.*, Chicago, 1935, **33**, 1022.
2 *J. Amer. med. Ass.*, 1933, **100**, 651.
3 *Amer. J. Psychiat.*, 1940, **97**, 384.
4 Ibid., 1943, **99**, 565.

PLANNING OF ACCIDENT SERVICES

Fractures may be the most important of the injuries encountered in accident departments, and the various suggestions for rehabilitation coming forward in recent years have had fractures chiefly in view. But an accident service must also embrace the treatment of injuries of soft tissue, infections of the hand, burns, tendon and nerve injuries, and indeed all injuries of the locomotor system, many of which are no less incapacitating than fractures and in total outnumber fractures in the proportion of five or ten to one. This point of view is urged in a memorandum on accident services published by the British Orthopaedic Association. It is pointed out that many large hospitals now have special fracture departments, but few have special accident departments, always excepting such recent developments as those at Birmingham and Oxford, where great attention has been given to the organization of such services. "Too often," says the memorandum, ". . . the most junior resident is given the responsibility of treating wounds, lacerations, and soft-tissue injuries, unguided and unaided by senior members of the visiting staff." A replanning of casualty departments to meet the demands of accident services is suggested. Near the entrance to the accident department many cubicles should be available where patients can be prepared, examined, and treated for shock. There must be immediate access to the radiographic department and from this to emergency theatres, and hospital beds must be available so that "minor" injuries may be treated under ideal conditions. In every ward one orderly, nurse, or masseuse should concentrate on early rehabilitation. Continuity of treatment must be maintained from the phase of emergency operation, through in-patient treatment and out-patient supervision, to final rehabilitation and after-care. The memorandum insists that orthopaedic surgery, which is the surgery of the locomotor system and concentrates on function, is not a narrow specialty. It requires men who have been trained and qualified in every branch of the subject—not merely "traumatic surgeons" but surgeons experienced in the locomotor system. Suggestions are made for the staffing of an accident department of a general hospital, a form of organization preferred to an "accident hospital." The point is also made that in rehabilitation there are two groups of cases to be differentiated—namely, the injuries of sedentary and light industrial workers, who can be rehabilitated, as a rule, within the precincts of the parent hospital, and the injuries of heavy industrial workers, who may need special centres in country situations, with provision for residence.

Dr. C. M. Wenyon, F.R.S., will retire shortly under the age limit from the position of director-in-chief of the Wellcome Research Institution and director of the Wellcome Bureau of Scientific Research. He has been associated for over 36 years with the research laboratories founded by the late Sir Henry Wellcome. Dr. Charles H. Kellaway, F.R.S., director of the Walter and Eliza Hall Institute for Medical Research, Melbourne, will take over the directorship-in-chief of the institution and the Foundation's other research laboratories as early in 1944 as possible. Dr. Wenyon has agreed to postpone his retirement until Dr. Kellaway reaches this country. Dr. N. Hamilton Fairley, F.R.S., now serving with the rank of Colonel A.A.M.C. as director of medicine to the Australian Army in the Pacific, will eventually take over the directorship of the Wellcome Bureau of Scientific Research.

MILK AND ITS PROBLEMS

A NUTRITION SOCIETY DISCUSSION

For the second time the Nutrition Society has held a joint meeting with the Food Group of the Society of Chemical Industry—this time on "milk," under the chairmanship of Prof. H. D. KAY, Director of the National Institute for Research in Dairying. Dr. Kay reminded the audience that the future of both nutrition and farming in Britain was bound up with the supply of milk, a key foodstuff. Special wartime problems of milk supply had interested three separate Ministries, and it was desirable that this collaboration should continue into the post-war years. A regular 10% yearly increase in the consumption of milk could then be hoped for, although it was necessary to remember the effect of the steadily changing age distribution of our population on any future expansion. Dr. Kay also insisted on the importance of adequate training of technical personnel engaged in milk production and distribution, and he welcomed the recent formation of the Society of Dairy Technologists.

Some Facts about Dairy Production

Mr. J. L. DAVIES, an officer of the Milk Marketing Board, gave an important factual survey of dairy production in this country. When his paper appears in full in the *Proceedings of the Nutrition Society* it will be interesting to study the figures of the distribution of farm sizes and herd sizes in Great Britain, and the number of producer-retailers in the country. Mr. Davies concludes that about half the farmers in the country are concerned in milk production, and that efficiency is possible with herds of from 15 to 100, provided conditions are suitably adjusted. He pointed out certain pitfalls in finding a true "average" figure for the annual milk yield of cows in this country; in his view it was legitimate to aim at a figure of from 600 to 650 gallons under good dairy-farming conditions. He made it clear, however, that these are often far from proper, and like other speakers he deplored the drudgery experienced by operatives working in bad conditions, and insisted on the importance of securing for dairy-farm workers at worst a six-day week and equipment enabling them to put into practice the universally accepted views of nutritionists and other health authorities. In Mr. Davies's view, half the dairy-farms in the country need extensive improvements, and one-third need complete rebuilding; the capital cost of such changes would be about £100 million. If plans are made now, it should be possible to secure the changes within ten years of the end of the war. A ten-year plan would also be needed to eliminate disease from our herds. If all the necessary steps were taken we could expect to produce enough milk to allow for an average daily consumption of at least three-quarters of a pint; in May of this year it actually reached the figure of 0.65 pint, compared with 0.37 just before the war. It is impossible here to do justice to the value and extent of the detailed figures supplied by Mr. Davies.

Pasteurization: Milk Nutrients

Dr. A. T. R. MATTICK of the National Institute for Research in Dairying read a paper in which many technical aspects of pasteurization were considered—including both the holder and the high-temperature-short-time (H.T.S.T.) methods. He spoke of the importance of pasteurization for stock feeding, as well as for the production of liquid milk intended to be drunk by human beings. Besides describing different methods of heat sterilization and the effects of these on various types of organism likely to be present in milk, whether from the infected udder, the farm-hand, the dairy water-supply, or the atmosphere to which the milk is afterwards exposed, Dr. Mattick condemned the view that "any old milk" could be pasteurized. Two of the practical proposals made by him are: first, an official ban on feeding farm animals with infected milk, and, secondly, the legal enforcement of a pre-pasteurization maximum bacterial count, if only in the interests of the producers themselves. Dr. Mattick also called attention to the importance of plant design management in the post-pasteurization handling of milk, particularly the bottling stage.

Dr. S. K. KON, also of the Institute, led a whirlwind tour through the land of milk nutrients, illustrated by some admirably summarized tables and diagrams. Speaking as a nutritionist, he gave most of his figures in terms of 1 pint of milk as the desirable daily consumption, thereby confirming the urgent plea of Mr. A. L. Bacharach, during the later discussion, that we should certainly not accept Mr. Davies's modest three-quarters of a pint as the ultimate goal of dietary sufficiency. Dr. Kon emphasized the importance of milk protein, not only because of its own high biological value but because of its supplementary effect on the cereal proteins with which it was habitually consumed. The traditional combination of bread and cheese is justified by amino-acid analysis. Dr. Kon also emphasized—an emphasis unfortunately more necessary to those absent from the meeting than to those present—that the effect of pasteurization, drying, condensing, and evaporating on the nutritive value of milk is negligible and of no consequence compared with the enhanced safety given by such processing. Dr. Kon made the point that separated milk, liquid or dried, is for adolescents and adults almost every bit as valuable as full-cream milk. In particular the supplementary value of milk protein applies to separated as much as to whole milk.

The figures given by Dr. Kon made it clear that the various nutrients in milk show a considerable range. He stated the problem—reiterated by the chairman in his closing remarks—of turning from considerations solely of quantitative milk production to nutritive value. It should be possible both to feed and to breed with the object of producing cows that will yield milk having not only constant but maximal amounts of its essential nutrients. During the discussion Prof. A. W. ASHBY expressed scepticism about figures that had been put forward to illustrate the extent to which this loss could be avoided. Prof. Ashby's views were obviously not accepted by Dr. W. R. Wooldridge.

Pasteurization Again

Some of those present thought that Prof. G. S. WILSON painted too black a picture of the present milk position. But there was no pessimism about his view that almost if not entirely all the present troubles arising from the distribution of unsafe milk could be most expeditiously and safely met by compulsory pasteurization. He devoted a little consideration to the "arguments," as they are sometimes called, of those who oppose pasteurization in general, and compulsory pasteurization in particular. There is, for instance, the tragic idea that immunity can be purchased by the hit-and-miss method of distributing tuberculous milk unsystematically, and at the cost of 1,500 to 2,000 young lives annually. One speaker suggested that those using this argument should be invited, on the basis of their own advocacy, to insist that all milk should be injected with a small immunizing dose of live tubercle bacilli. Prof. Wilson said that pasteurization was needed not only for the elimination of the bovine tubercle bacillus but also for eradicating *Brucella abortus* infection, post-secretory contamination from carriers of diphtheria bacilli, haemolytic streptococcus, and other pathogens.

In conclusion Prof. KAY stressed the connexion between a healthy food policy and a healthy agriculture in Britain, and insisted that pasteurization of raw milk supplies was a condition precedent to the nutritionally desirable increase of milk supply and consumption that had been so much in the foreground in the day's discussion. He also urged that research and practice should concentrate on reducing the variability of milk, and that we should aim at a standard of nutritive value below which it should be illegal to sell milk for consumption.

ALLOCATION OF MEDICAL MAN-POWER IN NORTHERN IRELAND

On Jan. 12, 1942, the Minister of Home Affairs appointed a Medical Personnel (Priority) Committee to consider the most economical allocation of the available medical man-power in Northern Ireland and to promote measures for securing the maximum co-operation to meet civil and Service needs in the area and the elimination of overlapping. This committee has since presented two interim reports, the main conclusions of which and the action taken on them being as follows:

(*a*) Figures supplied by the Central Medical War Committee show that of the total number of doctors whose names appear

in the Northern Ireland Section of the National Register of Members 20.6% are now serving with H.M. Forces. This figure is largely due to the good response which has been made by recent graduates; of the men who have qualified since 1938 60% have joined the Forces, the highest percentage in any one year being 72; and, if women graduates are included, the respective figures are 53 and 66. These figures, though relating to a system of purely voluntary enlistment, are nevertheless reasonably close to those applicable to the rest of the United Kingdom. It should also be borne in mind that a substantial number of Northern Ireland medical men have been recruited into the Forces elsewhere than in Northern Ireland.

(*b*) That the right of entry into panel practice should be restricted during the emergency with a view to protecting the practices of doctors in the Forces and to encouraging others to join. The Ministry of Labour has given effect to this recommendation by a Regulation made under the Emergency Powers.

(*c*) If conscription were to be applied to the medical profession in Northern Ireland it is unlikely that any further contribution would be possible from amongst the consultants and specialists, doctors holding hospital appointments, or those engaged in the public health, teaching, or research services.

(*d*) A substantial contribution would, however, be called for from among general practitioners. In the opinion of the committee it would be possible to maintain an efficient medical service for the civilian population under war conditions and at the same time to release for service in H.M. Forces a considerable number of doctors now engaging in private practice as principals (probably about fifty), and also a small number of assistants. The committee realizes the practical difficulties in the way of achieving this result on a voluntary basis.

Reports of Societies

INJURIES OF THE SPINAL CORD

At a recent meeting at Glasgow of the British Orthopaedic Association, under the presidency of Mr. G. R. GIRDLESTONE, there was a discussion on injuries of the spinal cord.

Mr. R. C. MURRAY, in an analysis of 21 patients admitted to an E.M.S. hospital, stated that the neurological lesion could usually be accounted for by a study of the radiographs, but that where no adequate cause was shown there might be a protrusion of bone from the back of the vertebral body which must be considered as a possible indication for early laminectomy. His series supported the view that in cord lesions with complete loss of function lasting 24 hours no recovery could be expected in segments below the lesion. Recovery was most possible in cervical lesions and in those below the first lumbar vertebra. There was no limit to the time of recovery of motor fibres in the roots and cauda equina. Reduction should be carried out in all cases, for even in complete cord lesions this might lead to the recovery of some roots and so add two or even three useful segments. Reduction should be followed by fixation; in the cervical region by continuous skeletal traction; after operative reduction by a hyperextension plaster jacket; and in cauda lesions by a plaster bed and turning case. The greatest difficulty, on account of pressure sores, was in dorsal lesions for which a complete combined plaster jacket and double spica were advised, so as to distribute pressure evenly and also facilitate turning and relieve pain and spasm. For treatment of the bladder tidal drainage was recommended. Finally, few cases should be regarded as hopeless, for even with a complete lesion at the level of the conus a patient might learn to walk.

Mr. ROLAND BARNES, reporting on a similar group of patients, stressed the importance of accurate sensory testing in assessing the degree and the prognosis of the spinal cord injury. It was more valuable, he said, than knowledge of the extent of motor paralysis. He had found that the prognosis was worse in lesions at the level of the twelfth thoracic vertebra than in those of the first lumbar. Laminectomy was never indicated as an immediate operation, but should be done when there was an incomplete paraplegia not showing spontaneous recovery, if there was evidence of increasing pressure upon the cord, or for severe and intractable root pains. He agreed that reduction of vertebral displacement should always be attempted, particularly if the paraplegia was incomplete. Radiographs of the highest quality were essential. Fracture-dislocations with locked facets were commoner than was generally realized. For this injury an open operation was indicated; the excision of articular processes should be avoided so as to maintain the stability of reduction, which usually should be further assured by internal fixation. For such operative cases he preferred a plaster bed and turning case.

Phosphatase in Bone Diseases

Prof. NOAH MORRIS, in a review of the present state of knowledge of phosphatase in diseases of bone, said that this enzyme, the function of which was to accelerate the conversion of organic into inorganic phosphate, was widely distributed in the tissues. If jaundice was excluded, increase of plasma alkaline phosphatase was pathognomonic of the presence of bone disorder. Of itself, however, it was of little value in the differential diagnosis of osseous lesions, but taken in conjunction with clinical, radiological, and other biochemical findings it was often of considerable assistance. The cause of the increase in plasma phosphatase was of some importance not only theoretically but also from the standpoint of the clinician. Destruction of bone *per se* was not accompanied by any marked increase of plasma phosphatase unless new bone or osteoid tissue was being formed. In the healthy individual the plasma phosphatase increased during periods of growth. Acceleration in rate of growth was associated with increased activity of osteoblasts. The factors regulating osteoblastic activity almost certainly included the rate of deposition of calcium salts. A reasonable hypothesis might be that if ossification was not maintained at a rate sufficient to meet the degree of cellular activity on which phosphatase formation depended, excess of ferment passed over into the plasma. If this hypothesis was correct an increase of plasma phosphatase might be expected as a result of: (*a*) increase in bone cell activity at such a rate that it could not be satisfied by the available calcium, or (*b*) insufficient intake of calcium and/or vitamin D.

With Mr. Matthew White he had been able to follow the course of the plasma phosphatase in a child with healed rickets during a period of calcium starvation and ammonium chloride administration. Here with the defective supply of calcium the plasma phosphatase showed considerable increase. The findings of Woodward and his co-workers with primary and metastatic tumours of the bone showed that with primary tumours an increase of plasma phosphatase occurred only when the tumour cells were producing phosphatase at a rate very much higher than that of normal bone tissue, and that a fall of plasma phosphatase after surgical removal or irradiation therapy was due to the withdrawal or inactivation of the phosphatase-forming cells. In bone metastases the increase of plasma phosphatase appeared to be due to a defence reaction manifest as increased bone formation adjacent to the tumour cells. Only when the reaction was osteoplastic did the serum phosphatase increase. In osteolytic lesions little change was observed.

It was clear that in many pathological conditions of bone such as rickets, osteomalacia, Paget's disease, and others, the variations of plasma phosphatase afforded a valuable guide to the course of the disease, the prognosis, and the effect of any therapeutic measure. Acid phosphatase was seen in many tissues, but if an increase was found in the plasma it almost invariably derived from prostatic glandular epithelium. Normally very little prostatic phosphatase appeared in the plasma, and it was abnormally high only when the blood and lymph vessels were invaded by tumour cells derived from the prostate. Of special value were serial determinations of plasma acid phosphatase in assessing the results of castration or oestrogen therapy.

Infection in Burns

In a paper on the control of infection in burns Dr. LEONARD COLEBROOK divided such infections into two groups: (1) the coccal infections of the first week, which were the most threatening to life and to rapid recovery but the control of which was well within sight; (2) the bacillary infections occurring when sloughs were separating, and which were largely responsible for the patient's anaemia and low state. The control of these might be expected only when much more trouble was taken in the prevention of hospital infection—especially from dust—and when a chemotherapeutic agent was available which was as effective against them as penicillin was

against the cocci. In 310 cases of burns admitted to the special unit of the Royal Infirmary, Glasgow, the methods used to obtain improved results included: strict aseptic precautions during the first few hours following admission, among them the use of sterilized blankets; an attempt to sterilize the burned surface by means of C.T.A.B. solution (without anaesthesia); the application of a bacteriostatic dressing which could be left undisturbed for 7 to 10 days (sulphanilamide or sulphathiazole in lanette wax SX and castor oil base—10% for most cases, 3% for extensive burns); prompt elimination by means of penicillin or propamidine of haemolytic streptococci from burns already infected, and various measures for reducing cross-infection—e.g., strict "no-touch" dressing technique; elimination of dust; masks, etc.

Mr. JAMES PATRICK, in a paper on supination and pronation in forearm fractures, stated that when a fracture had been well reduced it was found that limitation of movement was only to be feared in severe fractures of the head of the radius and fractures lower down in either bone which involved the attachment of the interosseus membrane by fibrosis, ossification, or shortening. It was important to realize that the axis of radial rotation was exactly along the interosseus ridge of the ulna. He emphasized the importance of lesions of the triangular fibrocartilage at the inferior radio-ulnar joint, not only in Colles's fracture but also in fractures of the head of the radius. For the latter cases he recommended early active rotation movements after the head had been excised. In fractures of the shafts of the radius and ulna operation should be avoided so far as possible; where necessary only the radius should be exposed and its interosseus aspect should not be encroached upon. Where cross-union occurred in the lower third of the forearm, excision of a segment of the ulna, including the fracture, gave good results. For permanently severe loss of rotation after Colles's fracture excision of the lower inch and the articular portion of the ulna also was good. Late angulation of fractures of both forearm bones was shown to be due to wasting of the brachio-radialis muscle, which allowed sagging of the fracture within the plaster case. Adequate support in the middle of the forearm mitigated this complication.

Other Papers

Mr. I. S. SMILLIE, in a paper on the regeneration of the menisci of the knee-joint in man, described the fibrous structure which partially replaces an excised meniscus. It was densely adherent to the synovial membrane at its periphery, it was thinner and narrower than the normal structure, and was whiter because it was composed of fibrous tissue only. Five cases were described in which regenerated "cartilages" had been torn—a circumstance which was rare unless factors producing gross instability were present within the joint. Dr. G. W. ARMSTRONG of the Canadian Orthopaedic Unit, with a cinematograph film, described his method of internal fixation by screws in carefully selected cases of oblique fractures of the tibia. Mr. ATHOL PARKES read a paper upon traumatic ischaemia of peripheral nerves occurring in a group of patients in whom a severe injury to the leg, with or without fracture, had been followed by gross swelling of the limb and anaesthesia of gradual onset spreading centripetally from the great toe over the foot and ankle. Later, objectively, paralysis with the reaction of degeneration was observed in all the intrinsic muscles of the foot with sensory loss in the distribution of all the deep nerves. Recovery was very slow. The condition was thought to be due to tension under the deep fascia from extravasation of blood and tissue fluids, causing ischaemia of the nerve trunks by pressure. For treatment it was suggested that early operation was indicated even when the peripheral pulse was present. Incisions through the deep fascia would relieve tension and prevent the development of an extremely disabling condition.

Clinical demonstrations were given at the Glasgow Royal Infirmary and at the Phillipshill Orthopaedic Hospital. At the latter Dr. A. K. BOWMAN, introduced by Mr. JAMES RUSSELL, gave an account of the influence of Glasgow in the development of orthopaedics, particularly in relation to the work of the Hunters, of Lister, and of Macewen.

The British Council has received a report from the Institute of Natural Science in Yenan, N.W. China, that Dr. Arov, a Soviet medical man, seeing the shortage in sources and the high price of cotton-wool, and the great demand for medical cotton-wool in surgical work, collected a great deal of spirogyra from the Yen River, dried it in the sunlight, wrapped it in gauze, disinfected it, and used it as pads to absorb pus and blood. According to practical clinical experiments, the absorbing capacity of spirogyra is five times that of gauze and seven times that of cotton-wool. The doctors in Yenan intend to use it on an extensive scale.

Correspondence

The Diet in Diabetes

SIR,—Dr. G. R. W. Luntz (July 3, p. 21) agrees with Prof. R. H. Micks (May 15, p. 598) in thinking that it is sufficient to treat a diabetic patient with insulin and an unrestricted diet. However, he thinks that this is undesirable for elderly obese patients and says that these should be strictly dieted. I agree with him that this type of patient should be carefully dieted, and that many of them will cease to pass sugar and have a normal blood sugar if the carbohydrate is restricted to about 100 g. carbohydrate. It may be necessary to give insulin as well for a time, though in this type of case it can often be given up. There is another large group, in whom I believe, as does Prof. Micks, that it is possible to control the glycosuria with great benefit to the patient. The great majority of patients of all ages who have an acute onset of diabetes are very easily controlled, whether the diet contains 150 to 250 or even 300 g. of carbohydrate, depending on the age and activities of the patient, together with 60 to 80 g. of protein and 70 to 100 g. of fat per day for an adult. While these patients are being stabilized and while they are improving under treatment they may have mild attacks of hypoglycaemia, but if care is taken these are rarely severe. Under these conditions the dose of insulin will often decrease from, say, 50 units to 20 or 10 units a day, and may in some cases be discontinued altogether for short or long periods. Patients are always pleased when the dose of insulin can be decreased and much prefer taking small doses to large ones; they are also pleased when the urine contains no sugar at all. If a patient fails to improve sufficiently to be able to give up insulin, Prof. Micks allows his patients to have an unrestricted diet. I, on the other hand, having with the help of dietitians trained the patients during this period how to vary their diet so as to make it palatable, find that the great majority of them maintain their diets carefully and vary their own dose of insulin. These patients keep well and lead very active lives.

A few patients are difficult to control from the beginning of the illness and are liable to frequent overdoses; others may develop this tiresome complication after the lapse of from one to nineteen years, and it is especially dangerous when the patient ceases to recognize the symptoms of hypoglycaemia. I agree with Prof. Micks and Dr. Luntz that these patients must be allowed to have a high blood sugar after meals, though this will not prevent all the attacks, as the hyperglycaemia may change so quickly to hypoglycaemia. Some of these patients are then uncomfortable and suffer from thirst and polyuria and lack of energy because the blood sugar is so high, though others do not have any such symptoms. Neither Prof. Micks nor Dr. Luntz gives any idea of the height of the blood sugar of his patients. I wonder whether they would disapprove of a blood sugar of 540 mg. per 100 c.cm. which I recently found in a girl of 14 who had just been discharged from a clinic which believes in unrestricted diets. She was then taking 76+60 units, but after being in hospital for two weeks on a diet containing 200 g. of carbohydrate with about 60 g. of protein and about 100 g. of fat only needed 42+22 units, and the blood sugar was below 200 mg. throughout the day without any symptoms of hypoglycaemia.

It is still difficult to give statistical evidence that patients suffer harm from having persistent hyperglycaemia. The patients whom I treated in 1923-4 and who refused to keep to the strict diets of those days certainly died much more quickly than the ones who kept to their diet (*Lancet*, 1938, **2**, 1), but some of them lived much longer than I expected. Nowadays the amount of carbohydrate in the diet is so much more generous than what I used then that it is rare that I find patients who do not stick to the diets, and with the aid of insulin they maintain a reasonable control of the diabetes so that I have little opportunity of telling whether patients do better or worse with continuous hyperglycaemia.

Dr. Luntz rightly points out that arteriosclerosis does not occur as a result of hyperglycaemia, and this complication is now accepted as being due to the low carbohydrate-high fat diets used for the first 6 years or so after the introduction

of insulin. The complication I dread is that of retinitis and cataract. Hyperglycaemia is not the only factor in the production of these conditions, and I have seen retinitis develop in elderly diabetics although the blood sugar has been well controlled. I have much more often seen it in patients who have had an uncontrolled diabetes for some years, and I have watched the retinitis improve when the diabetic condition has been brought under control. I believe that patients who are allowed to have a blood sugar above 250 or 300 mg. throughout the day run much greater risks of this complication. Prof. Micks says we shall know in 20 years, but by that time many patients may have suffered much from impaired eyesight. It seems a risk too great to be taken with our present knowledge. —I am, etc.,

London, W.1. GEORGE GRAHAM.

Neonatal Gastro-enteritis

SIR,—I was much interested in Dr. J. L. Henderson's article on neonatal gastro-enteritis (April 3, p. 410) and in his letter (May 15, p. 613).

During the months of February, March, and April, 1942, I used sulphaguanidine in the treatment of seventeen cases of this disease. The cases occurred in the nurseries of the Royal Maternity Hospital, Belfast. Fifteen were in premature babies whose average weight was 3 lb. 8 oz.; the remaining two were in full-term babies.

Two of the patients died; therefore the mortality rate was just under 12%. For the purpose of comparison I looked up the hospital records of cases of this disease during the years 1938 to 1941 (inclusive). During this period there was a total of 58 cases of gastro-enteritis with 20 deaths—i.e., a mortality of slightly over 37%.

The treatment given was as follows: The affected babies and all "contacts" were isolated. Feeding with breast-milk was continued. The breast-milk was obtained from nursing mothers either by hand expression or by a breast pump. Sulphaguanidine 0.125 g. was given four-hourly. This dosage was continued till the stools were normal in frequency, colour, and consistency. In only a few cases was it thought necessary to administer Ringer's solution subcutaneously.

My results suggest that smaller doses than those recommended by Dr. Henderson will give good results. I agree that it is necessary to give an adequate fluid intake, but I think that it is unwise to discontinue feeds with breast-milk. Breast-milk can be obtained, and I think that a baby requires its natural food as urgently during illness as during health. Fortunately vomiting was not a marked feature of the cases I saw, and therefore feeding did not present any unusual difficulties.

I agree with Dr. Henderson that controlled experiments are not justifiable when dealing with this disease. The dividing line between life and death in these cases is very narrow. Further, these babies are frequently those from difficult obstetric cases, and therefore one is not justified in carrying out controlled experiments with them. While clinical impressions may be incorrect, it is impossible not to be favourably impressed when the evidence can be seen growing stronger and heavier every day. Experienced members of the nursing staff in the hospital who had witnessed other outbreaks of this disease were certainly favourably impressed by the results obtained. In fact, I doubt if they would have permitted a controlled clinical experiment.—I am, etc.,

G. A. CRAIG, F.R.C.S.ED.,
Late Senior Obstetric Tutor,
Queen's University, Belfast.

Ayr, Scotland.

Epidemiology of Diphtheria

SIR,—I admire the caution of your conclusions in the leader on "Epidemiology of Diphtheria" (July 10, p. 44). One must in drawing conclusions from statistics in this disease take into consideration the capricious behaviour of the bacillus, as the following notes on a small epidemic in an isolated village show. The epidemic occurred eight years ago, before the days of immunization. The cases numbered 11 and the epidemic lasted two weeks.

1. The children affected (with one exception aged 7+) belonged to one class of the village school who were between 6 and 7 years of age, and the cases occurred at irregular intervals over a fortnight.

2. All the children affected (with the same exception) were inmates of sublet single apartments.

3. Every child had a brother or sister who occupied the same bed, but none of these was infected.

4. All the children of the school were examined regularly, swabs from suspicious throats being examined.

5. The origin of the epidemic was found to be a child of 3½ years with chronic nasal diphtheria whose brother was a member of the class. Swabs from throat and nose of the brother were negative.

6. The epidemic ceased immediately these two were isolated.

Since this experience I have noted how seldom swabs from contacts in a family where one member has tonsillar diphtheria are positive, and how universal the infection if the disease is nasal. It may be that the infectivity of the disease increases with the duration of the infection.—I am, etc.,

Bathgate, West Lothian. JOHN F. LANG.

Rehabilitation

SIR,—In Dr. Harold Balme's article on "Some Problems of Rehabilitation" (July 10, p. 47) he makes a number of points with which all consultants in physical medicine will agree; but there are others that call for immediate comment lest worse befall the patient in the future than in the past.

The points which will meet with warm agreement can be enumerated as follows:

1. "The effect of trauma on every type of soft tissue—fascia, muscle, tendon, serous and synovial membrane, etc.—demands careful study. . . . It should not, however, be difficult, by means of controlled experiment carried out on a sufficient number of cases, to establish definite criteria by which to judge of the methods suited to each class of disability and to each stage of recovery."

2. "Nothing would be more unfortunate than for rehabilitation to be divorced from medical or surgical control and established as a new health cult."

3. "In the first place, what do we mean exactly by rehabilitation? It is an unfortunate and clumsy term, and one which is already being used with a variety of different meanings, but from a strictly medical and surgical aspect it can perhaps best be defined as the method by which physiological function is fully restored after its temporary loss from injury or illness."

With regard to No. 1, physical medicine has for more than 20 years asked the Medical Research Council and other bodies for funds for definite investigation and has always met with a polite but firm refusal. There is no indication in Dr. Balme's article that such funds are anywhere in sight. Without them his premisses are but the paper recommendations we have all made over many years. Can he tell us whether the Ministry of Health is prepared to be generous and sponsor the investigation he calls for? Its actions up to date give less than hope that adequate investigation of physical methods is, or has ever been, part of its programme.

As all physical medicine consultants will agree with No. 2 this calls for no comment.

In reference to the definition of rehabilitation, it is possible to agree with Dr. Balme's description of the term as "unfortunate and clumsy," but his definition should have these words added: "and begins with the onset of the injury or illness." Rehabilitation is neither a new nor a separate subject.

So much for those aspects of his paper about which the practitioners of physical medicine can agree. In his paragraph headed "Organization of a Rehabilitation Team" he falls, however, into the fallacy (or is he being merely diplomatic?) so common, particularly among orthopaedic surgeons, that, by referring a case to a medical man with special training in physical medicine the physician or surgeon is losing control over the patient. He states that his "prescribers will of course consist of the physicians and surgeons actually in charge of the patients, whose duty it is to signify when rehabilitation should start." By this proposal he suggests perpetuating the worst features of inefficient physical medicine departments by putting those cases whose treatment the staff wish to delegate into the care "of one or more members of the whole-time medical staff," presumably a house-physician or other junior practitioner inexperienced in physical medicine. There is really no difficulty about the position or relations that should exist between members of the staff and the specialist in the medico-physical aspects of health and disease. All that is required is to adopt certain simple rules that have been in operation at the Royal Free Hospital for twenty years. These are:

(*a*) "Will Dr. —— kindly see and treat"—i.e., a complete transfer of the case to the physician in charge of the department.

(*b*) "Will Dr. —— advise *re* treatment?"—i.e., the case is seen, a report made, and the staff member decides whether to accept the advice or not. These patients see the referring member of the staff at stated intervals, if physical treatment is decided upon, and remain under him.

(*c*) "Will Dr. —— please give short wave, etc." These cases are treated by the *recommended method* unless technical considerations strongly contraindicate it, when the case is referred back with a report. These cases also remain under the member of the staff referring them. It is also understood that if a member of the staff wishes to insist on particular types of treatment the facilities of the department are at his disposal. But he must be sufficiently acquainted with all the techniques to be able to carry them out himself. From the patient's point of view is not this "a minimum reasonable requirement"?

Under the Royal Free Hospital rules full liaison exists and the consultant is able to develop and evaluate new techniques. Under Dr. Balme's proposed organization with multiple control, or only subordinate staff control, the departments would inevitably degenerate into "radiant heat–faradism–massage" annexes, as I have seen on all too many occasions, and occupational therapy rooms would become places where "arty-crafty" gadgets are made under the dignified name of diversional therapy. I confess I do not understand his "co-ordinating officer"—apparently non-medical.

Bring together, under a first-class clinician, rehabilitation, physical medicine—call it what you will, so long as it includes full access to proved physical methods, whether electrical, hydrotherapeutic, massage, exercises, physical training, or occupational therapy—and have rules of procedure agreeable to members of the staff and provision for research: and then rehabilitation will secure an honoured place in medical work, and Dr. Balme's review will have served a valuable purpose.—I am, etc.,

London, W.1. C. B. HEALD.

X Rays and the Colon

SIR,—In your issue of July 10 (p. 51) you report a discussion at the Proctology Section of the R.S.M., and in so doing the impression is given that Sir Arthur Hurst gave a warning against the use of *x*-ray diagnosis in diseases of the colon, although his words may have applied only to colonic spasm. In any case I feel obliged as a radiologist to comment on his statement, which may otherwise give rise to misunderstanding of the place of *x* rays in investigating the large bowel.

There is no viscus more readily examined radiologically than the colon in most of its length, and there is no one method of investigation so productive of information, although it must be repeatedly pointed out to clinicians that a radiologist's report is only offered as one link in the diagnostic chain, and it is unfair to place the responsibility of diagnosis upon any one such link. The colon may be filled with barium, either from above after a barium meal, or from below by a barium enema, and the former method gives little information unless gross abnormality is present, such as almost complete obstruction. By a barium enema, administered after thorough cleansing of the colon, the lumen may be entirely filled and deformities due to obstruction—tumours, diverticula, and the different types of colitis—visualized. Examination of the residue left after evacuation, with air inflation if desired, gives further valuable information about the state of the mucosa.

Presumably there is no real challenge to the value of *x*-ray diagnosis in the gross obstructive and deforming lesions, but in the investigation of cases of colitis and minor derangements of bowel function a word may be needed. Division of constipation cases into the types of rectal dyschezia and colonic constipation is readily made from the gross dilatation of the rectum seen in the former and the abnormal haustration and mucosal pattern of the latter, and, of course, organic disease of the colon is at the same time eliminated to a large extent—a point of great value, as the question of malignancy has to be considered in most cases. Ulcerative colitis shows well-marked radiological signs in all its stages, from the early irritable and pin-pointed mucosa to the late hose-piping and infiltration.

Sir Arthur Hurst very clearly points out the fallacy of diagnosing mucous colitis, but on this question of spasm and colonic catarrh a good deal of radiological evidence is available. A simple catarrhal colitis is often seen, with general excess of sticky mucus and widespread tenderness and spasm; and a chronic colitis, also associated with spasm, is recognized radiologically, and is by many regarded as one of the allergic family, and it is presumably this condition to which he specifically refers. Spasm is a most obvious thing radiologically, and it is difficult to see any objection to reporting on its presence and suggesting a diagnosis.

Finally, a word of caution may be offered as to one province in which the radiologist may be misleading, and that is in conditions affecting the upper rectum and recto-sigmoid, as this region is most difficult to visualize and radiograph owing to the overlying coils of sigmoid, and unless a clear view is obtained during the filling very little more is seen and an early ring carcinoma may be missed. Fortunately this distal colon is easily examined directly, and proctoscopy and sigmoidoscopy are definitely needed to supplement *x*-ray investigation of the colon.—I am, etc.,

Hove. E. MILLINGTON, D.M.R.

Aspirin and Gastric Haemorrhage

SIR,—The inflammatory reaction to aspirin seen in the gastric mucosa is limited to the immediate vicinity of the granules adhering to the stomach wall. This fact and the rapidity of development of the changes point to the action being a local one, and not a post-absorption effect as suggested by Dr. M. Honigsberger (July 10, p. 57). If further proof be needed it is supplied by the observation that calcium aspirin in solution has no effect on the gastric mucous membrane.

In regard to Sir Arthur Hurst's letter (June 19, p. 768) we should, I think, be careful not to include under aspirin-induced haemorrhage examples of sufferers from gastric or duodenal disease who have bled after taking the drug. It may indeed have provoked the bleeding, but it can be argued that it would have occurred in any case. It is by no means uncommon in a case of duodenal ulceration for haemorrhage to arise during a period of complete freedom from pain. I have recorded only those patients who have taken aspirin for pain not arising in the alimentary tract. If they bleed yet recover quickly with no trace subsequently of indigestion or radiological abnormality, it is reasonable to inculpate aspirin as the cause.—I am, etc.,

London, W.1. A. H. DOUTHWAITE.

The Nation's Milk

SIR,—In the proposed alterations concerning an improved milk supply the term "accredited" is retained. Surely this misuse of language should not persist. If a substance is "accredited" the public may rightly expect it to be trustworthy. The standard of bacterial purity required to reach "accredited" grade is so low that milk sold as such may still contain the living organisms of such diseases as tuberculosis or enteric fever. Veterinary inspection of herds once a year will not suffice to prevent such germs from reaching children whose parents think in supplying them with "accredited" milk they are thereby securing safety.—I am, etc.,

Northwood, Middlesex. ESTHER CARLING.

Intravenous Technique in Infants

SIR,—Dr. D. MacCarthy's paper (July 10, p. 36) on venoclysis was most welcome. He is to be congratulated on the scrupulous care he exercises, and uniformly good results are possible only with such care. Michelangelo's dictum, "Trifles make perfection and perfection is no trifle," must be remembered. Putting up a drip on a six-weeks-old infant is a great test of skill and patience, but it is a most satisfying operation when completed. Alterations such as the slight plantar flexion of the foot make the whole difference to the success or failure of the operation. Some points which I have learned by failure are, I think, worth mentioning.

This operation is often performed at night, and most difficulties seem to occur also at this time. Therefore a strong, powerful light is a *sine qua non*. Stooping over a low cot puts a strain on the operator; it is better to kneel by the cot. The instruments must be placed so that they can be got at easily without turning or stretching. Babies with fat ankles are often the most difficult, and little blobs of fat make the detection of the vein difficult. A pair of scissors such as those used by ophthalmic surgeons are a great aid in making a suitable "nick" in the vein. A severed vein does not mean failure; it is usually possible to pick it up and use it. A very fine forceps is most useful in picking up the V-shaped piece of vein preparatory to the actual insertion of the cannula. Getting the lip of the cannula into the vein is the most difficult part of the operation; once in, the remainder of the cannula slips in easily. I have succeeded in getting a full-size Hamilton Bailey

cannula into the saphenous vein of a baby five months old. Dr. MacCarthy's suggestion to retain the stylet in the cannula is an excellent one. After suturing the wound, the ligature can be passed through the holes in the wings of the cannula and tied. This prevents any movement of the cannula within the vessel, and in adults one can entirely dispense with a splint. The Baxter equipment is very easy to handle, and the rubber tubing is better than that supplied with E.M.S. sets. The latter is too stiff and has a spring-like action. On two occasions as I was about to tie the proximal ligature on the vein torsion on the tubing pulled the cannula out. Frequent swabbing and probing most certainly lead to sepsis. Also, one should never try for the vein higher up in the leg when one has failed lower down. The remaining point to discuss is—Which is the better, needle or cannula? We lose the vein for future use by cutting down on it and using a cannula. This is important in cases where repeated transfusions at intervals are required—e.g., blood diseases. Young diabetics if not stable may also require repeated infusions. In adults the needle is the method of choice for a single infusion, but for continuous infusion a cannula is better.

Finally, "blood is thicker than water." A blood transfusion in an infant often spells failure for the intravenous method. Blood will not run through a small needle or cannula even though saline will. Other methods such as giving it into the superior sinus or into the bone marrow may then be tried. Intraperitoneal infusion for saline must also be remembered. I am sure that papers giving full details about the practical side of these methods would be appreciated by all those interested in paediatrics.

—I am, etc.,

WILLIAM CAHILL.

Blood Grouping in Tubes

SIR,—The annotation on blood grouping (June 19, p. 764) emphasizes three cardinal points—namely, that accurate grouping is not a simple procedure; that grouping on cells and serum is essential; and, lastly, that it is desirable to use the tube technique. The M.R.C. War Memorandum (No. 9, H.M.S.O., 1943) sets forth the essential points and should be carefully studied by all concerned with blood grouping. In the light of my own experience in the Welsh Board of Health regional transfusion laboratory I should like to emphasize the great value of grouping in tubes. In the past three years upwards of 25,000 grouping tests have been performed per annum. From June, 1940, till August, 1942, all tests were performed on slides, and the majority were grouped on cells only. In August, 1942, grouping on glass slides was completely discarded in favour of tubes in view of Dr. G. L. Taylor's article on a reliable technique for the diagnosis of the A B O groups (*J. Path. Bact.*, 1942, **54,** 81). The tube method has revealed many errors made by the slide technique, and we have repeatedly had cause to be very thankful for the change over. It does mean extra work in the laboratory and more precise technique, but it is significant that the technicians prefer the tube method. Without exception all grouping is performed on cells and serum. If the latter is not available a further specimen is asked for.

A larger tube than that recommended by Dr. Taylor is used, the size being 2/5 in. × 2 in. (1 cm. × 5 cm.). Such a tube is convenient because it is easily cleaned. Larger volumes are used—namely, four drops each of saline, serum, and citrated cell suspensions. Tubes are stood 15 minutes and then centrifuged for 2 minutes at 1,500 to 2,000 revs. per minute. Beautifully clear-cut readings are obtained. With the tube-centrifuge technique it has never been necessary to use the microscope. Alternatively, tubes may be left to stand 4 hours (or overnight) on the laboratory bench and then read; the agglutinates are much larger and coarser than those obtained with the small tubes and smaller volumes recommended. I would emphasize the importance of using a thin rather than a thick suspension of cells.

A disconcerting discovery was that O had sometimes been wrongly diagnosed by the slide technique as AB or A, or A labelled O, etc., and the causes of these errors were largely cold or pseudo-agglutination. Routine grouping on serum effectively checks the results of grouping on cells and renders errors almost impossible, especially if tubes are used. Since using tubes we have eliminated well over a hundred errors, but there must be more because large numbers of persons grouped on cells by the slide technique only have not had their groups rechecked. The importance of correctly diagnosing O requires no emphasis, and I believe that this can most reliably be done only by grouping on cells and serum in tubes. The same of course applies to the other groups. I do not know what the percentage of errors is with the slide technique, especially when cells only are grouped, but I doubt if it is less than 1% in inexperienced hands, and it is probably more. Some years ago I observed two fatalities due to incompatible blood transfusion. Both were due to grouping on cells only and to faulty grouping by the slide technique. —I am, etc.,

R. DRUMMOND,
Regional Blood Transfusion Officer.

Cardiff.

Blast Injuries

SIR,—I have read (with delay) what Major J. V. Wilson states about the possible causes of death in blast injuries from high explosives (April 17, p. 470). Though not a pathologist, I have had occasion to examine a large number of corpses of civilian war casualties. Blast injuries were common, but these were generally associated with other lesions such as burns, splinter wounds, lesions to the skull from a knock against the ground or wall, etc. Only a very few cases could be considered as pure blast cases.

On one occasion I performed a post-mortem examination on two sisters, aged 8 and 13 years respectively, who had died in a badly constructed rock shelter in front of the only entrance to which a very heavy high-explosive bomb had burst. The dead children were found lying down in their sleeping-cots, and it was presumed that they must have been killed from blast injuries without having been knocked. External examination showed no lesion whatever. The abdominal viscera were markedly congested all over; the lungs had all the haemorrhagic lesions which Major Wilson portrays with perfect faithfulness in his paper. But most interesting was the condition of the brain. There was no lesion whatever in the scalp, skull, or dura mater, but this was on the stretch, and when cut through, the brain bulged out under excessive tension. On removal the brain was found very large, with flattened convolutions, very oedematous, and markedly congested; no haemorrhages were noticed.

The condition of the brain recalled the clinical observation that many wounded exposed to blast had presented on admission to the Central Hospital all the signs that are usually associated with cerebral concussion—unconsciousness or drowsiness, amnesia, irritability, headache, etc.

It is suggested that lumbar puncture and repeated enemata of magnesium sulphate may be of benefit in the early treatment of blast cases. No attempt was made to check the utility of this conclusion, as it was reached only when aerial bombardment on the island on a large scale had nearly come to an end.—I am, etc.,

WALTER GANADO.

Malta.

Psychiatry in General Hospitals

SIR,—Under the above heading (June 12, p. 735) we adduced positive evidence in demonstration of the striking success of the voluntary system in mental hospitals by application of the provisions of the Mental Treatment Act, 1930. In replying to Dr. Crichton-Miller's and Dr. Minski's observations (June 26, p. 800) we would point out that both correspondents are at pains to find objections to the mental hospital which our voluntary patients (mainly psychoneurotics) have themselves already learned to surmount.

In stressing so particularly "the locked door" of the mental hospital, Dr. Crichton-Miller has chosen a singularly inapposite objection. Our gates are open night and day; moreover, out of eight male wards one only is kept locked—the so-called closed ward. A similar though less extensive arrangement holds good on the female side, and all our villas where the psychoneurotic cases are housed are conducted entirely upon the open-door principle. By applying such a word as "condemned" to those who freely place themselves under care Dr. Crichton-Miller reveals a prejudiced outlook; he surely can have no true conception of what the mental hospital of to-day is really like.

Turning now to Dr. Minski's letter, he begins by simply begging the question as to whether the so-called neuro-psychiatric unit does in fact succeed in inducing people to undergo early treatment in those alleged cases where the mental

hospital is said to fail. We have already shown that, despite the proximity of chronic patients properly segregated, patients are not in fact deterred from voluntarily seeking admission to mental hospitals, and this accounts for our high increase in admissions during the past ten years. Dr. Minski attributes to us, by the interpolation of words we did not use, assertions which we ourselves avoided. We made no claim that the mental hospitals "originated" the modern physiotherapeutic treatments; the exact phraseology was "initiated and evolved," and Dr. Minski might refer to Drs. Andratsche and Rogerson's article on page 780 of the issue in which his own letter appears, which says of electric convulsion treatment that "credit for the introduction to this country must be shared between Fleming, Golla, and Grey Walter (1939) and Shepley and McGregor (1939)."

Stigma is the social ostracism that is attached to any mental illness, and will exist so long as the general opinion towards mental disorders remains unenlightened. The mental ward of the general hospital labours under the same stigma as the mental hospital, despite the introduction of euphemisms such as "neuropsychiatric wards," and the dropping of the word "mental." Furthermore, the general hospital is neither situated nor equipped so as to be able to provide those occupational and recreational facilities which are indispensable adjuncts in the rehabilitation of the mentally afflicted.

In conclusion we would urge that the requirements of mental treatment to-day are such that the patients' interests are best served by their being treated in a hospital designed, equipped, and staffed for the purpose—in short, a mental hospital.—We are, etc.,

T. P. REES.
W. H. SHEPLEY.

SIR,—Dr. Minski's statement (June 26, p. 800) that the modern physical treatments in psychiatry originated in American and Continental neuropsychiatric clinics and not in mental hospitals contains several mistakes. While insulin treatment and electrically induced convulsions were first applied in university clinics, Meduna initiated convulsion treatment and Moniz performed his first leucotomies in mental hospitals. University clinics on the Continent are frequently not part of a general, but of a mental, hospital. I do not know of any method that originated in America, but American psychiatrists have applied all those mentioned on a large scale in their varied types of hospitals.

There is no doubt that, as Dr. Minski points out, a great variety of treatment facilities for psychiatric cases is desirable. If one remembers the long pre-war waiting lists of many psychiatric institutions and the large number of psychiatric patients only recognized as such after being called up to the Services, it is difficult to understand why specialists should now quarrel where they should be treated. Those who welcome with enthusiasm psychiatric wards in general hospitals seem to forget that these are already in existence. May I briefly refer to two of them in different parts of Britain.

One of these hospitals belonging to a progressive municipality has a psychiatric department with well over 600 beds and a yearly admission rate of 700 patients. The "observation ward," containing approximately 100 mental defectives and the same number of senile dementias, has one doctor, who during recent years was not a psychiatrist. There are no treatment facilities. A somewhat similar psychiatric department forms part of the other hospital, for which the corporation is responsible. It was originally intended for neurotics, but is now filled with 400 psychotics, many of them of the chronic type. There are one full-time psychiatrist and two visiting specialists, and the therapeutic possibilities are only slightly better than in the institution first referred to. Both places, although parts of general hospitals, are in fact merely "dumping grounds" for patients who, for one reason or another, cannot be admitted to the mental hospitals, where they could receive suitable treatment.

I would suggest that these facts show that successful psychiatric work depends not on the type of hospital but on proper staffing and equipment—in other words, appreciation by the authorities of their duties towards the mentally ill and of the dimension of the social problem of psychiatry.—I am, etc.,

Crichton Royal, Dumfries. W. MAYER-GROSS.

Resuscitation by Rocking: Adaptation for First Aid

SIR,—Dr. N. Howard Mummery's rocking apparatus for Eve's method of resuscitation (June 19, p. 759) would appear to be excellent for, as he says, rescue stations, also ships, hospitals, etc. It is, however, not particularly suitable as a portable adjunct to first aid.

The N.C.O.s of the medical section of this battalion, along with the director of the Civil Defence first-aid posts in the district, have given some time to the study of the possibility of applying this rocking method to first aid. They believe it to be, from what they have read on the subject, the most efficient method yet known. The technique is easy to learn. It is much less arduous and more foolproof than any previous

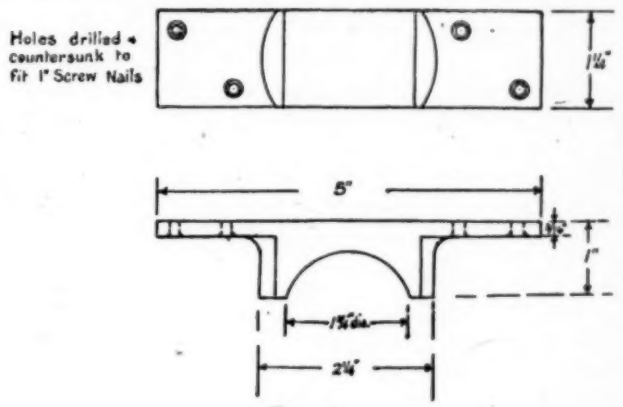

FIG. 1

form of artificial respiration, and, once it has been set in motion, it can be carried on by quite untrained personnel. For these reasons it would appear to be the method of choice.

To take the place of the rather cumbersome apparatus described by Dr. Howard Mummery we are having a little "gadget," of which I enclose a sketch, attached to all our stretchers of the Army type—a pair to each stretcher. It is, in essence, merely a grip to slip over any available pole, hayfork handle, fence, rope, paling, etc., so that the rocking of the stretcher may be carried on. The gadget is of the "lazy-block" pattern, and has been made for me by Mr. Robt. Colquhoun, chief engineer of Messrs. Baird and Dalmellington's Fauldhead Collieries. It consists of a base plate which is fixed to the centre of each stretcher pole by four screw nails. From the plate arises an attachment for fitting over the pole, bar, etc., on which the rocking is to be done. It is easy to make, and there should be little or no expense incurred in converting

FIG. 2

Army type stretchers into rocking stretchers. We have tried it out in practice and we think that it works. It may be open to some grave criticism—if so it can easily be scrapped. We claim no patent rights, but, if acceptable, it might perhaps be known as the "Kirkconnel" adaptation.

It seems only fair that the men who have worked for a forward step in first aid should be known; their names are Sergts. A. McAnespie and J. Torrance, and Cpl. D. Hastings of this battalion, along with Mr. Robert McCormick, Civil Defence First-aid Post Controller, Upper Nithsdale. The sketch of the gadget has been made by Lieut. G. Broadfoot, Kelloholm. —I am, etc.,

BOWMAN EDGAR,
Kirkconnel, Dumfriesshire. M.O., 4th Battn., Dumfriesshire H.G.

Artificial Respiration

SIR,—Dr. E. Granger (July 3, p. 23) propounds a "swing-boat" method of artificial respiration. His arguments are based on inaccurate mechanics. Eve's rocking method over some fulcrum *below* the centre of gravity of the patient is the more efficient from any slight body slide, which is arrested by the friction of clothing or by suitable straps, the inertia of the

viscera thus having a succussive effect. The extra effort needed to reverse the position encourages the necessary slow steady rate, with a pause at the limit of each excursion. Centrifugal force is negligible. The method is highly efficient even in unskilled hands.

The "swing-boat" has a self-stabilizing horizontal position and an easy natural period, as has any comparable device of linkage producing rotation about a virtual fulcrum above the centre of gravity of the patient. When it is worked steadily at that period (as it would obviously be) it subjects the viscera to no great longitudinal displacement, but to centrifugal force in a dorsi-ventral direction only!

Personal experience will show that one is unable to resist the rhythm of Eve's method, whereas the prone position on a swing induces no respiratory compulsion.—I am, etc.,

London, S.W.1. D. STENHOUSE STEWART.

Treatment with Tuberculin

SIR,—I am much interested to see the correspondence on the use of tuberculin in your issues of June 12 (p. 736) and July 3 (p. 19).

I used Dr. Camac Wilkinson's method very extensively from 1910 to 1913, and again in 1918 as tuberculosis officer in Portsmouth, and published the full account of the methods with the results I obtained in a book called *Dispensary Treatment of Pulmonary Tuberculosis*, published by Baillière, Tindall and Cox. Circumstances made it difficult to follow up the after-history of the cases since 1919, except in a certain number of private cases which have confirmed the value of the remedy. I have not been engaged in medical work since then, but in the course of social welfare work during this war have had contact with a tuberculosis dispensary and have been disappointed to find that there appears to be no improvement in the treatment of the disease to justify giving up a remedy which, although not perfect, gave very satisfactory results in a great proportion of cases. The recent development of *x*-ray diagnosis should greatly increase the confidence with which tuberculin treatment could be used and the results estimated.

If any of your readers would find the study of my cases in Portsmouth useful and is unable to obtain a copy of my book, I shall be glad to lend a copy.—I am, etc.,

Ashtree House, Horton Kirby, Kent. HILDA CLARK.

Subcutaneous Ligature of Varicose Veins

SIR,—Although I do not consider the method of Major Goldstone is the ideal surgical treatment of varicose veins, there is no doubt that many cases will not respond to injection treatment no matter how skilfully applied, and some form of surgery is necessary. However, to suggest, as Mr. R. R. Foote does (July 3, p. 22), that the surgical mortality is a serious matter is plain nonsense. I have performed or supervised the ligation at various sites of several hundred cases without a death, and I know of several large series which have been equally successful.—I am, etc.,

Brentwood. W. D. PARK.

The Cult of Negative Health

SIR,—The argument propounded by Dr. Alan Maberly (July 10, p. 55) that the environment must be sufficiently unfavourable for the living organism to thrive is nothing but the crude Darwinian theory of the struggle for survival which gave nineteenth-century *laissez-faire* its pseudo-scientific benediction. It is a doctrine adopted, significantly enough, by our Nazi and Fascist enemies, who extol the virtues of hardship and blood-letting as a race invigorator. The rest we know to our cost and peril. A second world war is being fought to put an end once and for all to a "jungle" struggle for survival, and at its victorious conclusion to extend to mankind for the first time a modicum of ordered security in a world of fellowship.

To preach the salutary effect of "an environment sufficiently unfavourable" in these days of agonizing human effort and suffering is proof of an approach completely out of touch with current social realities. Does Dr. Maberly think (for his argument implies as much) that absenteeism in the coalfields and in industry in general is due to the environment—i.e., the conditions of labour—not being unfavourable enough to stimulate the men to greater efforts? One can imagine the reception such a doctrine would have if preached in South Wales, Tyneside, or the Clyde.

Furthermore, I do not accept the analogy between the living organism and society as postulated by Dr. Maberly. Society is a congeries of classes and sects, political and economic, shot through at various levels by a diversity of religions. Order and stability are at best a precarious compromise dependent upon the relative predominance of a class or sect at a particular period. Society is never homogeneously soft or fat; indeed, it is only because one section of the community is fat that the other is thin, and in our particular state of social organization this is a necessary condition of affairs.

In the modern world Russia alone gives the lie direct to the argument that "not only has a greatly improved standard of health been accompanied by an increasing tendency to hypochondria, but an equally great improvement in social services and economic security has run parallel with an increased anxiety about the future, with lessened individual self-confidence and self-reliance." There (before the war) a steadily rising standard of living has gone hand in hand with a steadily diminishing incidence of neuroses of all types (see Williams, F., *Soviet Russia Fights Neurosis*, 1933), plus a fearlessness and an optimism heightened by the quiet confidence of the individual in his and his country's future. Present events confirm this. The inherent danger of the arguments put forward by Dr. Maberly and by Dr. R. E. Lucas (June 19, p. 766) is that they play straight into the hands of those reactionaries who see in every attempt at social amelioration the nefarious work of Satan, who would set free idle hands for evil purposes.

Surely there is suffering enough in the world without emphasizing the danger of waxing soft and fat in an environment not sufficiently unfavourable. Time enough when such physical calamities as cancer and tuberculosis have been conquered, and when social diseases such as economic and political injustice have been laid low, to talk of softness and waxing fat. We should not forget that man creates his own environment, and so badly has he adapted himself to it that he is in great danger of extinction through a variety of causes all in the power of man to eradicate. It seems to me most inopportune to stress the need for an unfavourable environment in such days. On the contrary, it is our duty to adopt a "positive" attitude, and to define our conception of a favourable environment and to struggle for its achievement.

For me, at any rate, a favourable environment is one in which man can express his physical, mental, and spiritual capacities to the full in a harmoniously integrated personality and so achieve positive health: a *sine qua non*, a state of political and economic democracy. To-day we are committed to scientific industrialism. The problem of post-war leisure and "practical problems" which have caused Dr. Lucas such misgivings are complementary and interconnected. We cannot enjoy the one without facing up to the other. In a world that is already contemplating a little fearfully the problem of post-war mass unemployment such misgivings about our future use of leisure are completely out of court in this context. In the last analysis it is not a question of how many or how few electrical gadgets a country housewife may or may not possess, but the old problem of the State and her sense of community within it.—I am, etc.,

Bush Hill Park. W. LESTER, M.B.

Medicine and Politics

SIR,—It seems that the well-disciplined armies now mobilizing against the idea of change and development in our medical services must be provided with banners in the form of catch-phrases which exert a hypnotic effect upon them and rally them to the attack. That well-worn slogan, "Free choice of doctor," still inspires many, perhaps the majority of whom acquired the bulk of their patients by purchase from their predecessors. Dr. Geoffrey Bourne, appealing to another section of medical interests, has raised as his standard the sacred name of science. Some of his supporters may find it difficult to live up to this rallying-cry.

Controversy becomes easier when it can be expressed in such simple and colourful pictures as that of the noble person

of science set upon by the black-hearted politicians (in the scientific words of Dr. Bourne, "either ignorant, incompetent, or dishonest"). The fact is, of course, that many of the present deficiencies in our medical services have nothing whatever to do with "science," and Dr. Bourne cannot be allowed to evade these matters by such an easy device.

Let us take a simple example from the field of hospital services. A member of the public in need of hospital treatment seeks admission to a voluntary hospital. He finds that his chances of early admission to the hospital of his choice are infinitesimal, but they can be greatly increased if he is able to pay a private fee and consult a member of its honorary staff. If he feels this to be wrong, to whom should he appeal—the "scientists" or the "politicians"? (If Dr. Bourne doubts whether such a situation frequently arises, I can furnish him with particulars of some recent examples at hospitals well known to him.) Such matters are of more immediate concern to the people whom we serve than the abstract claims of "science," and if we believe in democracy, as Dr. Bourne does, we must concede the people's right to protest against them and the duty of democratic government to remedy them. Perhaps it is considerations of this kind which have given rise to the development of municipal hospital services. At present more than 80% of the hospital beds required by the people of London have to be provided by public authorities, and this would not be necessary if voluntary organizations had proved equal to our needs.

Municipal hospitals, like other institutions, have their faults, and it is easy (and legitimate) to criticize them. From the public's point of view, however, they have one simple virtue: they are *responsible to the public* for the provision of hospital treatment to those in need of it. For the very large proportion of patients suffering from diseases of the types which are unpopular in "scientific" institutions, this virtue outweighs many disadvantages.

Science, too, has its claims, and if Dr. Bourne is familiar with the magnificent public authority hospitals in countries where voluntary hospitals are unknown (for example, in Scandinavia), he must realize that science can and does flourish in such hospitals. In attacking the relatively archaic form of organization of our own municipal hospitals Dr. Bourne is largely tilting at the windmills, for their organization will undoubtedly develop and progress as do their standards of treatment. Those of us who work in municipal hospitals are not blind to their faults nor unconscious of their opportunities for development and improvement.—I am, etc.,

London, W.9. A. L. JACOBS.

Conditions for Good Work

SIR,—The average doctor is inarticulate, has no time for thinking or writing, and after recent events is more fatalistic than ever; it is therefore the extremes of opinion that are voiced. Of all that has appeared in print Mr. Wilfrid Adams's letter (July 10, p. 53) most nearly expresses the feelings of the average general practitioner and goes to the root of our present difficulties—namely, numbers.

Most of our troubles, both those mentioned by Mr. Adams and others, can be abolished, but only by a great increase in the numbers of the profession. State interference is now necessary because the average income cannot afford full and efficient up-to-date medical service; so the main feature of that interference should be financial subsidy. Given the money and the personnel, success could be achieved without making devastating changes; lacking either, any scheme must fail.

It is essential, therefore, by offering reasonably attractive prospects and by other means, to ensure an adequate supply of recruits and greatly increase the numbers of the profession; otherwise a vicious circle may develop with great detriment to the good of the community.—I am, etc.,

York. CHARLES C. COBB.

It is generally agreed that the solanaceous alkaloids are useful in the symptomatic treatment of Parkinson's syndrome. H. Volmer (*Arch. Neurol. Psychiat.*, Chicago, 1942, **48**, 72) concludes from his own experience that a combination of alkaloids is more effective than any one given separately, and found that the best mixture is 90.2% hyoscyamine hydrobromide, 7.4% atropine sulphate, and 2.4% scopolamine hydrobromide.

Obituary

The recent death of HUGH WELLS ARMSTEAD at Seaton, Devon, whither he retired on giving up practice in London some years ago, removes one of those very highly qualified and gifted members of the profession who fifty years ago did not disdain the status of general practitioner but are now much more likely to adopt a specialty. He was educated professionally at St. Bartholomew's Hospital and School, where he was successively exhibitioner, junior scholar, senior scholar, and senior house-surgeon. He qualified M.R.C.S., L.R.C.P. in 1892; M.B., B.S.Lond., with 1st-class honours in medicine; M.D.Lond. and F.R.C.S.Eng., both in 1894—a record which speaks for itself. He was for a long time a well-known London general practitioner, and published his reminiscences and reflections entitled *Thirty Years of General Practice*. Outside his professional interests, his leanings may be gathered from his *Artistic Anatomy of the Horse* and his contributions to the *Magazine of Art* on similar topics. For several years he was a member of the Council of Epsom College, until increasing deafness and his departure from London led to his resignation. He had been a good friend to the College, and to its library, as well as a regular subscriber for many years.

Dr. GERALD S. EWEN, of East Twickenham, who died on June 26 at St. Bartholomew's Hospital, joined the B.M.A. in 1912 and was chairman of the South Middlesex Division in 1924-5. He was born in Jamaica in 1877 son of the Hon. William Ewen, and from Lord Weymouth's Grammar School came to England to study medicine at Bart's, qualifying M.R.C.S., L.R.C.P. in 1902. During the last war he served in Salonika with a temporary commission in the R.A.M.C. Dr. Ewen had been honorary medical officer of St. John's Hospital, Twickenham, since 1921.

Lieut.-Col. H. C. Keats, I.M.S. (ret.) writes: It was with great regret that I read of the death of Lieut.-Col. H. J. SHIRLEY. I knew him not as a doctor but as the colour sergeant of G Co. the Artists Rifles in the '90's. This company, of which I was a humble member, was composed of medical students, and I think that Scharlieb (as he then was) was the smartest colour sergeant in the regiment. A keen soldier and a strict disciplinarian, he was a man of great bonhomie and charm when off parade. I have very pleasant recollections of the little suppers we sometimes had in some small Soho hotel after Saturday parades. Personally I think he was cut out for a soldier and would have risen to high rank had he been in the Regular Army. The Artists want no advertisement; the value of their work and training was seen in the last war. And it was to such men as Col. Shirley that their efficiency was due; men who unselfishly gave up their leisure hours to promoting the efficiency of their famous corps.

The Services

Col. B. C. Ashton, V.H.S., I.M.S., has been appointed Honorary Surgeon to the King in succession to Major-Gen. A. A. C. McNeill, I.M.S. (ret.)

Temp. Surg. Lieut. J. F. J. Kelly, R.N.V.R., has been mentioned in dispatches for good services to the wounded in a ship which was attacked by U-boats.

Majors (temp. Lieut.-Cols.) H. J. R. Thorne and C. H. Kerr, R.A.M.C., have been awarded the D.S.O., and Capt. T. Reilly, R.A.M.C., has been awarded the M.C., in recognition of gallant and distinguished services in the Middle East

Capts. H. M. MacFie, W. Robinson, and J. F. Webb, R.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in North Africa.

Brig. (temp.) E. A. Sutton, O.B.E., M.C., late R.A.M.C., has been appointed C.B.E. (Military Division), Lieut.-Col. S. W. T. Lee, Lieut.-Col. (temp.) T. F. Anderson, and Major (temp. Lieut.-Col.) D. Bell, E.A.A.M.C., have been appointed O.B.E. (Military Division), and Major A. Galloway, South African Forces (attached E.A.A.M.C.) and Lieut. (temp. Capt.) L. P. Harington, Southern Rhodesia Medical Corps, have been appointed M.B.E. (Military Division) in recognition of gallant and distinguished services in East Africa and Madagascar.

Capt. C. P. Blacker, M.C., R.A.M.C., has been awarded the George Medal in recognition of conspicuous gallantry in carrying out hazardous work in a very brave manner.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in East Africa and Madagascar: Col. (temp.) B. C. O. Sheridan, M.C., Capt. (temp. Major) W. N. Hood, and Capts. G. C. Griffiths, R. H. Isaac, and W. H. Whyment, R.A.M.C.; Lieut.-Col. C. H. Marshall, Majors (temp. Lieut.-Cols.) W. K. Connell, D. D. McCarthy and C. E. Roberts, and Capt. (temp. Major) N. J. Willans, E.A.A.M.C.; Lieut.-Col. J. Wakeford and Major P. Baron, Southern Rhodesia Medical Corps.

CASUALTIES IN THE MEDICAL SERVICES

Prisoners of War.—Major R. T. Binns, A.A.M.C.; Wing Cmdr. D. Magrath, R.A.F.

The notification that Dr. N. H. R. McCallum had been mentioned in dispatches, published in a *Supplement* to the *London Gazette* of June 22, should have read Temp. Surg. Lieut. N. H. R. McCallum, R.N.V.R.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on July 1 the degrees of B.M., B.Ch. were conferred on J. A. Ritchie, and (*in absentia*) R. E. Lee.

UNIVERSITY OF LONDON

GUY'S HOSPITAL MEDICAL SCHOOL

The following awards have been made for 1943: *Entrance Scholarship in Arts*—R. Handy. *Entrance Scholarship in Science*—B. J. Silkoff.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—J. E. Beviss, M. P. Bourke, [1] A. G. M. Davies, Mercia J. Griffiths, C. H. Gurd, Elisabeth Hodson, (Mrs.) Lois M. Leitch, D. E. Olliff, [2] Mildred I. Pott, D. A. Sarsfield, [3] S. S. Short, T. R. Stephens.

[1] Distinction in forensic medicine and toxicology. [2] Distinction in public health. [3] Distinction in surgery.

UNIVERSITY OF DURHAM

At a Congregation held on June 30 the University of Durham conferred the degree of D.Ch. *honoris causa* on Major-General P. H. Mitchiner, C.B.E., T.D., surgeon to St. Thomas's Hospital.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—A. B. Concanon, G. Sanderson, Mary D. H. Sheridan, V. K. Summers.

M.B., CH.B.—*Part III*: Mary A. R. Allan, Muriel C. Andrews, A. Ansell, E. R. Banner, Beryl R. Bentley, R. A. Blyth, N. Broughton, Hilda E. Bullen, W. G. Canning, G. Davies, I. H. Foy, Joan O. Grant, E. N. Hugh-Jones, Eirwen M. Jones, J. J. Lieben, I. P. Madhok, Margaret L. Magee, A. W. Merrick, Jean C. Miller, K. H. Oldfield, E. W. Parry, E. Scott, K. H. Slatter, Nora Taggart, G. A. Wetherell. *Passed in Separate Subjects*: A. S. Beadel (Surgery, Obstetrics and Gynaecology). H. Francis (Medicine, Obstetrics and Gynaecology). Irene W. Simpson (Medicine and Surgery). *Part I*: M. K. Alexander, J. T. D. Allen, E. T. Anderton, H. B. Andrews, Beryl G. Anscombe, [2] G. Ansell, K. W. F. Baruch, [2] J. P. D. Bates, T. J. Boag, [1 2] Edith M. Brown, E. Cooper, [2] D. Craddock, Constance M. Davis, B. Dover, [2] K. R. Dumbell, E. D. Edmondson, J. L. Edmondson, J. W. L. Edwards, R. Ellam, P. Foster, I. J. C. Frew, B. R. Frisby, S. Gillis, N. J. Gourdji, [2] D. A. Gregson, C. R. Helsby, [2] Winifred L. Hollick, G. Hughes, L. Jacobs, D. C. R. Jones, E. S. Jones, H. A. Jones, J. T. W. Jones, P. R. B. Jones, R. S. Jones, M. Kirwan, W. T. W. Lawson, Joyce R. Lewis, S. Lipton, J. B. Lynch, K. McCarthy, M. G. McEntegart, [2] R. H. Martlew, [2] Lucille F. Morgan, [2] D. B. Mossman, C. M. Ogilvie, C. A. Pearson, H. H. Pilling, J. B. Roberts, Isabel S. Smellie, G. W. Storey, P. J. Taylor, W. A. Thompson, Corris Venables, H. Wickham; J. R. E. Wilson. *Passed in Separate Subject*: A. D. Charnley, H. T. Davenport, Muriel E. St. Pier (Pharmacology and General Therapeutics).

[1] Distinction in Pathology and Bacteriology. [2] Distinction in Pharmacology and General Therapeutics.

UNIVERSITY OF GLASGOW

At a graduation ceremony at Glasgow University, held on June 24, the degree of Doctor of Laws (LL.D.) was conferred on Air Marshal Sir Harold E. Whittingham, K.B.E., M.B., F.R.C.P.Lond., F.R.C.P.Ed., F.R.F.P.S., Director-General, Royal Air Force Medical Services.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates have satisfied the examiners at the examinations indicated:

M.B., B.CH.—*Obstetrics and Gynaecology*: S. Brest, I. F. Barwell-Clarke, [1] Joan Collins, K. V. Crowther, [1] A. D. Evans, Eileen J. Evans, [1] H. J. Fisher, J. C. Hughes, R. G. Hughes, D. C. W. Jenkins, D. I. Jenkins, H. O. Jones, T. L. Jones, Alice M. A. Lee, Sarah M. Lewis, D. A. Macfarlane, Eiry Morgan, Mary W. Owen, E. J. Parr, J. L. J. Phillips, Winifred S. Philips, Isabella M. Pinkerton, I. Rees-Mathews, D. B. Richards, F. W. Richards, E. G. G. Roberts, W. Stevenson, Gertrude G. Thomas, L. P. Thomas, V. V. Tracey, H. O. Williams, Mary L. Williams, W. H. Williams. *Pharmacology*: W. H. Beasley, J. W. Bowen, B. L. Crystal, M. L. Edwards, L. A. J. Evans, M. Evans, J. C. Ham, D. W. James, W. J. Jenkins, C. G. W. Mason, I. Matthews, Isobel F. A. Mitchell, Nesta G. Morgan, Margaret Owen, D. R. Price, E. G. Rees, O. V. Rees, D. M. Rowlands, [1] R. M. E. Seal, D. R. Thomas, D. V. Thomas, G. H. Thomas, D. Tooms, Catrin M. Williams, Roberta Williams.

[1] With distinction.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of Council held on July 8 Sir Alfred Webb-Johnson was re-elected President and Mr. H. S. Souttar and Sir Girling Ball Vice-Presidents.

The following appointments were made for the ensuing year:

Hunterian Professors.—Prof. G. Grey Turner, one lecture on the Construction of the Ante-thoracic Oesophagus; Surg. Rear-Admiral G. Gordon-Taylor, one lecture on the Technique and the Results of the Surgery of Peptic Ulcer, with Special Reference to the Value of Regional and Splanchnic Anaesthesia; Brig. Noel St. J. G. D. Buxton, one lecture on Gunshot Wounds of the Knee-joint; Prof. A. B. Appleton, two lectures on the Bronchi and Blood Vessels of the Lungs; Mr. W. Stirk Adams, one lecture on the Problem of Acute Otitis Media in Children and the Response of the Infection to Sulphonamide Therapy; Surg. Cmdr. J. B. Oldham, one lecture on Coccygeal Sinus; Mr. J. F. Brailsford, one lecture on the Plasticity of Bone; Mr. T. Holmes Sellors, one lecture on Constrictive Pericarditis; Mr. T. M. Tyrrell, one lecture on the Surgery of the Lacrimal Sac; Dr. R. B. Zachary, one lecture on Factors influencing Recovery after Nerve Suture.

Arris and Gale Lectures.—Dr. N. M. Goodman, one lecture on the Supply of Subjects for Dissection: A Historical Review; Dr. Herbert Haxton, lectures on (1) the Function of the Patella, and (2) the Anatomy of Progression.

Erasmus Wilson Demonstrators.—Mr. L. E. C. Norbury, one demonstration on the pathological contents of the Museum; Mr. C. E. Shattock, one demonstration; Mr. R. Davies-Colley, two demonstrations on Certain States of Bone Absorption; Surg. Rear-Admiral Cecil P. G. Wakeley, two demonstrations on Tumours of the Alimentary Tract.

Arnott Demonstrator.—Dr. A. J. E. Cave, six demonstrations on the contents of the Museum.

Macloghlin Scholar.—Michael Hatton of Epsom College.

Diplomas

A Diploma of Fellowship was granted to A. M. L. Smith, M.B., Ch.B.

Diplomas were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN PUBLIC HEALTH.—D. Hewspear, A. S. Hoseason, Joyce B. M. Mayes, S. J. Sutton.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—C. Anderson, H. M. Cohn, D. L. Davies, Wilhelmina L. Devlin, Elizabeth P. Dodds, H. M. James, Joan E. Mackworth, R. R. Prewer.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—J. C. Liddle, P. S. Meyrick, C. P. Williams.

Medical Notes in Parliament

Food Conference at Hot Springs

In the House of Commons on July 6 Mr. EDEN made a statement on the result of the Food Conference recently held at Hot Springs. He said that the Government accepted the resolutions passed and the obligations to give effect to them in so far as they applied to conditions in the United Kingdom. They would also commend the resolutions to the Governments of the Colonies and oversea territories. The third resolution recommended that Governments should immediately begin the task of increasing food resources and improving the diets of their peoples in accordance with the principles and objectives outlined in the findings of the conference. The Government intended, despite the inevitable difficulties which the war entailed, to press on with this aim. They intended to participate fully in the work of the interim commission to be set up to prepare a plan for a permanent organization in the field of food and agriculture. One of the tasks of the commission would be to draw up a formal declaration or agreement for the consideration of the respective Governments, which would recognize their obligation towards their peoples and to one another to collaborate in raising levels of nutrition and standards of living.

In the House of Lords Lord ADDISON also called attention to the Hot Springs conference. Lord WOOLTON said that the recommendations of the conference covered the short-term and long-term phases of post-war development. The first two years after the war was bound to be a time of great stringency on the food front. We must prepare for that stringency now, as well as do what we could to meet the circumstances of the present stringencies in Europe and Asia. In the generally improved standards of nutrition and the special provision made for what the conference called "the vulnerable groups"—children, pregnant women, nursing women, and factory workers—we in this country had made really remarkable progress. Undernutrition had been vastly reduced during the war, and this was reflected in an improved national health bill. The creation of the interim commission would mean that the work of the conference would not be left in mid-air, and the Government intended to participate fully in the work of the commission.

Nurses (Scotland) Bill

Lord ALNESS, for the Government, in the House of Lords on July 7 moved the second reading of the Nurses (Scotland) Bill, which had already passed the Commons. He said one part of the Bill set up a new grade of assistant nurse, a second part restricted the use of the title "nurse," and a third established licensing and inspection of "nurses' co-operations." A period of five years had been fixed by the Secretary for Scotland for setting up the grade of assistant nurse.

The Bill was read a second time. On the following day it was taken by the House of Lords in Committee.

Lord Alness accepted amendments moved by Lord Craigmyle to make clear that hospitals provided by the Department of Health for Scotland might be used for training assistant nurses. He said the Secretary for Scotland had communicated on the matter with the General Nursing Council for Scotland.

Lord CRAIGMYLE moved to provide that nothing in the Bill would prevent Red Cross nurses, V.A.D.s, and others now known as Red Cross nurses in Scotland from calling themselves nurses. Lord ALNESS said that, in view of the diversity in training and experience of V.A.D. nurses and nursing auxiliaries, it was impossible to promise that the regulations when made would authorize these women to call themselves nurses. Mr. Johnston would look into their claim to be so called. The amendment was withdrawn.

Lord CRAIGMYLE moved a further amendment designed to ensure that the General Nursing Council should take into consideration the training and experience gained by Red Cross, auxiliary, and assistant nurses in nursing the sick and wounded in a reputable hospital under the eyes of a fully qualified sister. He said the amendment left the General Nursing Council to decide what remission of time should be allowed to these nurses who had reached a standard of competence and training. The core of the hospital problem in Scotland was not absence of beds but shortage of nurses. Lord GEDDES said the women referred to in the relevant clause of the Bill were those who were to become State-registered nurses. In the interests of the sick he begged the House to insist that every woman on the State register of nurses had the necessary training in the fundamental sciences. V.A.D.s, if they wished, should be helped to get the training. He thought the V.A.D.s had had a "raw deal."

Lord ALNESS said the Secretary for Scotland had made a concession to assistant nurses who had at some time undergone training as student nurses. Under Lord Craigmyle's amendment any V.A.D. or auxiliary nurse who had been three weeks in a hospital might claim remission of training. The Minister of Labour and National Service was communicating with the General Nursing Councils of both Scotland and England to see whether some concession should be made in the direction proposed by Lord Craigmyle.

Lord Craigmyle's amendment was rejected by 20 to 18 and the Committee stage was completed.

Towards Cleaner Milk

On July 8 Mr. ROBERT HUDSON announced that the Government had reviewed the livestock situation in the light of prevailing trends in milk and meat production with the object of improving the quality and quantity of our milk supply. He said the basis of a sound milk policy must be a well-bred, healthy dairy herd. At present a large number of herds in the country were not inspected at all. It was proposed in future to arrange for a minimum of one inspection a year for every dairy herd and to inspect more frequently, within the limits of the available veterinary personnel, those herds with a bad disease history or where the milk was not heat-treated before sale.

To ensure the production of cleaner milk the National Milk Testing and Advisory Scheme was introduced last year. Already over 70% of the milk producers were having their milk regularly tested, while nearly 90% of the larger creameries operated the scheme. With a view to greater efficiency and uniformity in methods of milk production the Government would submit to Parliament, after consultation with local authorities in England and Wales, legislation providing for the transfer to the Ministry of Agriculture of the functions now exercised by local authorities in regard to the production of milk, including designated milk, on the farm. His Department would become responsible for all matters relating to the production of milk. Owing to transport difficulties much of the T.T. milk now produced was not sold to the public as such, but was bulked with and sold as ordinary milk. To encourage the production of this valuable milk the Government proposed to pay a uniform production premium of 4d. a gallon. The Minister of Food would take all practicable steps to ensure that as much T.T. milk as possible in present circumstances was sold as such to consumers. The price would be only slightly higher than for ordinary milk. Schemes introduced by the Ministry of Food for the rationalization of the retail distribution of milk deprived the public in areas to which such schemes applied of their freedom to choose their milk suppliers. In some cases persons who previously made a point of buying pasteurized or T.T. milk now received ordinary raw untreated milk. This placed upon the Government the obligation to ensure, as soon as possible, that all milk supplied to consumers in areas affected by rationalization schemes should conform to the higher standards of purity previously demanded. The Government's intention was to prohibit, in areas to be scheduled, the retail sale of milk unless it was (*a*) T.T. milk; (*b*) accredited milk sold by a retailer who sold the milk of a single accredited herd; or (*c*) milk which had been rendered safe by means of heat treatment. This policy would be applied, in all areas affected by schemes for the rationalization of retail distribution, as rapidly as the necessary plant could be made available.

A White Paper was published on July 8 which gave Mr. Hudson's proposals in greater detail and set out a parallel scheme for Scotland. In that country it is not proposed to take from local authorities the powers they possess over milk supplies.

Comprehensive Health Service

Mr. ERNEST BROWN told Lady Apsley on July 8 that in connexion with the discussions for a comprehensive health service, he hoped fairly soon to issue a general statement which might serve as a focus for the views of all interested bodies. He had undertaken at that stage to get into touch with the Associations of Medical Aid Societies.

Alien Doctors in Hospitals

In answer to Sir Robert Young on July 8 Mr. ERNEST BROWN said the number of doctors of Allied and neutral countries employed as such in hospitals was 200. The number of specialists included in this total was not available. An oversea doctor could acquire a British medical qualification by passing one of the qualifying examinations after the appropriate period of study. He could also be placed temporarily on the British *Medical Register* if the General Medical Council was satisfied that he fulfilled certain prescribed conditions as to the holding of medical diplomas and otherwise. Mr. Brown added that his approval was not required for the qualification or registration of an individual doctor.

Higher Education and Research in the Colonies

In the House of Commons on July 13 Colonel OLIVER STANLEY gave a comprehensive review of the progress made in colonial affairs and of the plans for the future. He said that educational advance and economic development were the twin pillars on which any sound scheme of political responsibility must be based. With regard to higher education, it was quite clear that if our goal of colonial self-government was to be achieved colonial universities and colleges would have to play an immense part. They would have to meet the enormously increased need for trained professionals which increased social and economic services would necessitate. They would have to provide the agriculturists, engineers, doctors, teachers, veterinary surgeons, and specialists and technicians which the approach to higher standards of life would entail. They would have to do an immense amount of research. In encouraging the constructive growth of these universities and colleges, the guidance and help of the home universities must be looked for. It would be a tremendous gain if, in a way, the colonial colleges could be admitted as partners in the circle of the home universities, and if there could be an intellectual Lend-Lease between the universities here and the colonial centres of higher education. He believed that the practical difficulties, which were many, could be overcome. He was accordingly setting up a Commission of Inquiry, with Mr. Justice Asquith as chairman, to inquire into the general problem of the relationship between home and colonial universities, and the way in which the latter could best be assisted. He was also setting up a Commission of Inquiry into higher education in British West Africa, of which Dr. Walter Elliot would be chairman, and on which three African representatives had been invited to serve.

Col. Stanley added that with regard to primary education the whole question of reducing mass illiteracy was now being considered by his Advisory Committee on Education, and he hoped shortly to receive its report. The Minister said that our objective in the Colonial Empire must be to make the Colonies self-supporting.

Medical News

Dr. A. J. Amor has been appointed Chief Medical Officer of the Ministry of Supply with effect from July 19, in succession to Air Vice-Marshal Sir David Munro, who has relinquished that appointment. Sir David Munro has been appointed Medical Adviser to the Ministry with effect from the same date.

The Distinguished Service Medal and Award of the American Medical Association for 1943 has been conferred on Dr. Elliott Proctor Joslin, whose outstanding work on diabetes is recorded in the *Journal of the American Medical Association*.

The President of Poland has conferred the Order of Polonia Restituta, Third Class, on Prof. Sydney A. Smith, M.D., Dean of the Faculty of Medicine, University of Edinburgh, and Prof. F. A. E. Crew, M.D., F.R.S., in recognition of services during the war.

After the annual general meeting of the Medical Society for the Study of Venereal Diseases to be held at 11, Chandos Street, Cavendish Square, W., to-day (Saturday, July 24), a medical meeting will begin at 2.30 p.m., when papers will be read on hyperthermia in the treatment of resistant gonococcal and non-specific urethritis, and on physiological changes in fever treatment.

On July 21 the Minister of Agriculture attended the centenary commemoration of the founding of the Rothamsted Experimental Station, Harpenden, when the laboratories, field experiments, and the 100th wheat crop on Broadbalk Field were inspected at the invitation of the Lawes Agricultural Trust Committee, of which the Earl of Radnor is chairman.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week there were 304 more notifications of scarlet fever and 26 more of diphtheria, but there were 1,609 fewer cases of measles and 81 fewer of whooping-cough.

Only small changes in the trend of diphtheria within the counties were reported. The largest variations in the totals for scarlet fever were rises in Yorks West Riding 35, Lancashire 33, and Essex 31. The greatest rises in whooping-cough were in the counties of Southampton 35, Durham 32, Warwick 31. The largest falls in the notifications of measles were Staffordshire 155, Lancashire 148, Norfolk 140, London 118.

The notifications of dysentery rose from 13 to 120. The only new outbreak was in Leicestershire, Hinkley U.D. 10; 14 more cases were reported from the outbreak in Bristol C.B.; the only other large centre of infection was London, with 20 cases in ten boroughs.

In *Scotland* the notifications of infectious diseases fell substantially: whooping-cough by 107, measles by 88, dysentery by 44, and scarlet fever by 43; but diphtheria was up by 15 cases. The reduction of whooping-cough was due to a fall of 103 in Glasgow. Glasgow, with 98 fewer cases of measles, was also responsible for the downward trend of this disease, the outbreaks in Edinburgh and Dundee remaining at a constant level. In Paisley the cases increased by 37. The number of cases of cerebrospinal fever has been fairly constant for the whole country during the past five weeks, but there has been a slight drop in Glasgow, where 19 of the 30 cases occurring during the week were recorded.

Quarterly Return for England and Wales

The birth rate during the first quarter of this year was 16.8 per 1,000, the highest rate for a first quarter since 1928, and was 2.0 above the average for the five preceding March quarters. The sex rates of births were 1,070 males to 1,000 females, compared with an average for the ten preceding first quarters of 1,058. The infant mortality was 60 per 1,000 live births—14 below the average of the ten preceding first quarters. The rate for stillbirths was 33 per 1,000 of the total births registered. The general death rate was 13.5 per 1,000, compared with an average of 16.5 for the five preceding first quarters. The natural increase—excess of births over deaths—was 34,251. In the March quarter of 1942 the increase was 6,963, while in the first quarters of 1940 and 1941 the births were in defect of the deaths by 50,838 and 31,610.

The number of persons marrying was 124,674. This was 51,770 fewer than in the first quarter of 1942, and was the lowest number in any quarter since the outbreak of war.

The Week Ending July 10

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,959, whooping-cough 2,284, diphtheria 580, measles 3,593, acute pneumonia 502, cerebrospinal fever 49, dysentery 93, paratyphoid 12, typhoid 8.

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INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 3.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	49	2	30	3	5	105	4	36	3	7
Deaths		—	1				—	2		
Diphtheria	608	36	163	65	21	728	39	171	44	21
Deaths	10	1	—	4	1	17	2	5	3	1
Dysentery	120	20	64	—	—	242	22	46	—	—
Deaths				—	—		1	—	—	—
Encephalitis lethargica, acute	5	—	—		—	6	—	1	—	—
Deaths		—					—	—		
Erysipelas			37	4	1		—	41	7	2
Deaths		—					—	—		
Infective enteritis or diarrhoea under 2 years				44						
Deaths		3	8	9	5	30	2	12	5	4
Measles	4,165	213	234	8	8	7,581	815	249	97	233
Deaths	1	—	—	—	—	5	1	4	1	—
Ophthalmia neonatorum	109	2	24	1	—	83	3	5		—
Deaths										
Paratyphoid fever	10	3	1		—	14	—	2	2	
Deaths	—	—	—		—	—	—	—		—
Pneumonia, influenzal*	530	27	7		10	734	35	5	3	8
Deaths (from influenza)	7	—	1	—	—	11	—	1	—	—
Pneumonia, primary	530		194	12				184	20	
Deaths	7	19		5	10		—		5	7
Polio-encephalitis, acute	—	—				2	—			
Deaths		—					—			
Poliomyelitis, acute	5	1	—	5	—	7	—	1	1	—
Deaths		—					—	—		
Puerperal fever		1	20		—	—	—	15	4	1
Deaths							1			
Puerperal pyrexia†	149	6	16	3	2	161	9	17		2
Deaths		—								
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,984	171	201	39	54	1,396	84	229	74	29
Deaths	1	1	—	1	—	7	—	—	—	—
Small-pox	—	—	—		—	—	—	9		—
Deaths				—	—	—	—	1	—	—
Typhoid fever	8	—	1	6	2	4	—	1	7	1
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	2,249	100	133	42	38	1,457	128	17	37	12
Deaths	10	—	5	—	1	7	—	—	1	—
Deaths (0–1 year)	284	30	60	34	20	282	31	51	18	20
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,742	508	580	175	120	3,726	527	562	165	106
Annual death rate (per 1,000 persons living)			13·1	11·5	‡			12·6	11·0	‡
Live births	6,563	793	934	478	323	6,083	709	921	390	283
Annual rate per 1,000 persons living			19·1	31·4	‡			19·0	26·0	‡
Stillbirths	190	16	33			227	20	19		
Rate per 1,000 total births (including stillborn)			34					20		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Primary Vaccination of Adolescents

Q.—*I have been asked to vaccinate a previously unvaccinated girl aged 12 years, as she is being sent to a boarding school, the head master requiring such vaccination before her admission. (1) Is such a primary vaccination either safe or desirable in the absence of a small-pox epidemic? (2) What is the dosage of lymph for intra- or sub-cutaneous vaccination, and do such methods leave a scar?*

A.—1. The Ministry of Health deprecates the imposition of vaccination as a condition of admission to an institution or of employment in this country. The vaccination of persons of adolescent or school age who have not been previously vaccinated is not desirable unless they have been in contact with a case of small-pox or have been directly exposed to small-pox infection.

2. It is customary to use 0.1 c.cm. of 1:50 to 1:200 dilution of lymph—i.e., of vaccinal pulp after its dilution with glycerin water 1 in 5 or 6; but we do not know the amount of vaccinia virus in the pulp. This necessarily varies with the time and method of collection, and there is no method of ascertaining the virus content. There is no scar formation (unless there is accidental vesicle formation), and in this connexion Henderson and McClean (*J. Hyg.*, Camb., 1939, **39**, 680) noted that unless there was vesicle formation there was little immunity. These authors found a definite correlation between the appearance of a typical epidermal vesicle and the subsequent development of immunity. It is to be borne in mind that calf lymph is not sterile, and the possible danger of introducing adventitious organisms into or under the skin should be considered. In some cases persistent induration is said to follow.

Streptococci and Nephritis

Q.—*Will a chronic streptococcal infection of the throat cause high blood pressure by insidiously damaging the kidneys?*

A.—So far as is known, streptococcal infections of the throat only cause high blood pressure through the medium of nephritis, in which condition albumin is rarely absent from the urine, and red cells and casts are usually present also when the spun deposit of a fresh specimen is examined. Wintenwerder *et al.* (*Arch. intern. Med.*, 1935, **56**, 297) have found that the persistence of streptococci in the nasopharynx is commoner in nephritic patients in whom the condition is progressive than in those who recover, but operations to remove infected foci produced neither disappearance of the organisms nor amelioration of the nephritis. It is not yet clear whether nephritis is the result of a reaction between streptococcal antigens and antibodies, or due to a different agent such as a virus.

High Blood Pressure in Pregnancy

Q.—*What is considered high blood pressure in pregnancy, especially in the last month, in the absence of clinical signs of renal affection? What does it signify? I have a patient aged 23 years in her last month of pregnancy, with no evidence of renal trouble, but her blood pressure is 170/80. I have read somewhere that this may bring on premature labour.*

A.—It is generally accepted that at any stage in pregnancy a systolic pressure of over 140 or a diastolic pressure of over 80 is pathological. Some authorities even put the limits of normal as 130 and 70. In the absence of evidence of nephritis the raised blood pressure is indicative of either essential hypertension or of pre-eclamptic toxaemia. In the case of essential hypertension the blood pressure is raised throughout pregnancy with a tendency to exacerbation in the later weeks. In pre-eclampsia the rise of blood pressure does not usually occur until the last one or two months of pregnancy, but may precede other signs such as albuminuria and oedema. Patients suffering from essential hypertension are more likely to develop pre-eclampsia or eclampsia; so whichever is its cause the raised blood pressure in this particular case should be regarded as being of serious significance. Premature onset of labour is one of the common complications of the toxaemias of pregnancy, but there is no direct connexion between a rise in blood pressure and the onset of labour.

Deafness after Scarlet Fever

Q.—*A patient, partially deaf since childhood (due to scarlet fever), recently had a severe catarrhal cold with subsequent copious mucopurulent discharge from the nose. When this got better his hearing considerably improved, and in fact has been better than it has been for two years. He is now aged 54. Is there any remedy that would keep his hearing fairly normal? At present I think it is about 80% normal, whereas for a considerable time past it has hardly been 40%. Eustachian inflation has done no good.*

A.—Unless accurate observations with an audiometer were made of this patient's hearing it is not possible to form any valid conclusions. The late Dr. Albert Gray, however, observed that in a few cases of otosclerosis a coryza caused a temporary improvement in hearing, which was attributed to an increase in the blood supply from vasodilatation. Possibly a cervical sympathectomy might have the same effect, but it would be too experimental to be seriously considered.

Cows, Rheumatism, and Streptococci

Q.—*Do cows suffer from rheumatic arthritis and endocarditis? If so, that would explain where the infection of acute rheumatism comes from.*

A.—Cows do not suffer from rheumatic arthritis and endocarditis: there is in fact no animal naturally subject to rheumatic fever as seen in man, though various other forms of arthritis are common among them. The insusceptibility of animals is actually an obstacle to the experimental study of rheumatic fever. There are, however, strong reasons for regarding infection, primarily involving the throat, by haemolytic streptococci as an essential part of rheumatic fever, if not its whole cause. The cow or its milk is thus involved to the extent that in some cases they may be the source of the infection. Streptococcal mastitis in cows is occasionally due to infection of human origin, the streptococcus being of Group A, and thus liable to produce serious disease in man: more commonly it is of Group B (*Streptococcus agalactiae*), which is much less pathogenic to man. Alternatively, milk may be directly contaminated by cough spray or otherwise from a human source. This ever-present danger constitutes one of the many reasons why general pasteurization of milk is necessary in the interests of the public health.

Jaundice after Serum Injection

Q.—*Is the jaundice following the injection of measles serum and other sera (homologous serum jaundice) due to the lighting up of a dormant virus?*

A.—There is, as yet, no evidence that homologous serum jaundice is due to a virus. It has been assumed by many workers that this condition is due to the virus of infective hepatitis (epidemic catarrhal jaundice). It should be noted, however, that the incubation period of the two conditions is different: 2 to 3 months in homologous serum jaundice and round about 1 month in infective hepatitis. Perhaps one should not have used the term "incubation period" for the former condition, since there is no real evidence that it is an infective process. It may be, but that remains to be established. Two additional points make one hesitate to accept the view that homologous serum jaundice is due to the virus of infective hepatitis. It is assumed that certain batches of serum are icterogenic because they come from donors who happened to have this virus in the circulation when they were bled; yet it is strange that no well-established case exists of jaundice following transfusion with whole blood. The second point is the absence of well-authenticated secondary cases arising as the result of exposure to a case of serum jaundice. Future investigations should be made with a view to an unequivocal answer to these two points.

Oestrogens for Small Breasts

Q.—*One of my patients, a multip.-2, has small, rather shrunken breasts, of which she complains for cosmetic reasons. She is otherwise well developed. Oestradiol inunctions have proved useful for undeveloped virgin breasts. Would they achieve anything in a case of this nature? What dosage should be employed? "Progynon" ointment contains 0.1 mg. of hormone in 1 g. of base. What is the strength in i.b.u.? Are there likely to be any ill effects from the continued use of oestradiol, and is the susceptibility to conception increased?*

A.—Incomplete development of virgin breasts is due to the relatively low concentration of oestrogen secretion in the adolescent girl. Small shrunken breasts in a multip.-2 without other evidence of oestrogenic deficiency indicate a peripheral resistance on the part of the breasts to the normal ovarian activity rather than a lack of intrinsic oestrogen. Such local insensitivity is often very obstinate and is unlikely to be overcome by extrinsic oestrogen administration.

It is improbable, therefore, that oestradiol inunctions would achieve any spectacular result in such a case. Dosage is still rather arbitrary. Oestrogen ointments containing 2 mg. per g. are available, and the higher dose should be preferred, though there is evidence that local application is more effective in such conditions than an equivalent dose given either by the oral or parenteral route. 0.1 mg. is equivalent to 1,000 i.b.u. Continued use of oestrogens is to be deprecated. The most likely ill effect is disturbance of menstruation as evidenced either by temporary suppression of menstrual bleeding if the dose is sufficiently effective or excessive uterine haemorrhage with a less effective dose.

Inhibition of pituitary function may result from continued high dosage of oestrogen, though this is usually seen only in cases of obvious pituitary over-activity. For instance, high-dosage oestrogen therapy is temporarily of benefit in cases of Cushing's syndrome (pituitary basophilism) and acromegaly (pituitary eosinophilism). The carcinogenic tendencies which may result from continued administration of oestrogen have been frequently cited by certain clinicians. Though consideration of the pertinent animal experiments is reassuring on this point, it would be foolish to suppose that administration of, say, 1 mg. of oestrogen daily for a period of 3 years would be without risk. If the susceptibility to conception were to be affected at all it would be diminished. Though oestrogen could in no manner be described as a contraceptive, continued high dosage would tend to inhibit the luteal (or secretory) phase of the menstrual cycle and would therefore not favour conception.

Some Drug Conundrums

Q.—*A patient of mine has been taking a preparation of potassium iodide 9.25%, caffeine 1.32%, and sod. benz. 1.85% for about two years. He apparently stood this preparation well until about a month ago, when he came out in an iodide rash. On my advice he stopped taking it, and he found that he became very short of breath, especially on exertion, and in fact has had to go back to the preparation and gradually reduce the dose; but he is not able to give it up altogether. He suffers from bronchial trouble with emphysema; no real asthma. Thinking there was probably an adrenal deficiency through the caffeine, I put him on tablets made up of suprarenal extract gr. 1/2, thyroid gr. 1/12, orchic substance gr. 2; but this does not seem to have had much effect. I have also suggested inhalations of 1 in 100 adrenaline when the dyspnoea became pronounced.*

A.—The effective element in the first preparation is probably the potassium iodide. The development of intolerance in this way is unfortunately not unusual; it may be to some extent alleviated by intermitting the drug for a time. The expectorant action of the iodide might be duplicated by ammonium chloride gr. 5 t.d.s., or apomorphine hydrochloride gr. 1/32, or a combination of the two. The only active agent in the second preparation is the thyroid, as neither suprarenal nor testicular hormones are absorbed in this dosage by mouth. In any event there is no evidence that patients with asthma or emphysema suffer from adrenal exhaustion, which appears to be a mythical malady invented by the advertising agents. In experimental animals denervation of the adrenals or even complete sympathectomy does not lead to notable functional disturbances under normal environmental conditions. If the patient complains of exhaustion, it may well be due to the withdrawal of the caffeine, which is a cerebral stimulant. The caffeine and sodium benzoate might therefore be given alone or be replaced by another xanthine derivative—theophyllin with ethylene diamine, gr. 1½ to 3 t.d.s. Otherwise an attempt may be made to replace the drug with either amphetamine sulphate or methedrine, 2 to 4 mg. at breakfast and noon; or ephedrine hydrochloride gr. 1/2 with phenobarbitone gr. 1/2 p.r.n., up to thrice in the day. Finally, the value of respiratory exercises is worth stressing, particularly in a case of this kind, in which there may be a considerable fraction of neurasthenia.

Premature Greying of Hair

Q.—*Is there any treatment which holds out hope of a cure for premature grey hair?*

A.—Following the observation that pantothenic acid and *p*-aminobenzoic acid are necessary for normal pigmentation of the hair of the rat, which becomes grey in their absence from the diet, attempts have been made to treat premature greyness in human beings with these substances. Success has been claimed for the treatment of such cases with vitamin B complex preparations and with *p*-aminobenzoic acid (*Science*, 1941, **94**, 257) in conjunction with endocrine products (thyroid). The dosage of *p*-aminobenzoic acid was 100 mg. twice daily by mouth. After about two months' treatment darkening of the hair was reported. The calcium salt of pantothenic acid has been tried in doses of 100 to 500 mg. twice weekly intramuscularly, but appears to be ineffective (*Amer. J. digest. Dis.*, 1943, **10**, 45). If *p*-aminobenzoic acid is used it must be discontinued if sulphonamides are ever given. Of suitable vitamin B complex preparations yeast is the cheapest.

Premature loss of the colour of the hair is occasionally a manifestation of endocrine disorder, and particularly is this so in Simmonds's cachexia (hypopituitarism), but the hair changes are usually associated with other endocrine features. It is well known that a sudden shock may cause a greying or whitening of the hair, but it is less well known that a sudden shock may be followed by the syndrome of Simmonds's cachexia, probably via the hypothalamic–pituitary mechanism. About the treatment of this condition little is known from an endocrine point of view, but in one case of incomplete Simmonds's cachexia following parturition, in which the hair tended to lose its colour and become dry and brittle, the administration of testosterone produced a return of colour, lustre, and silky appearance. Such therapy should be used with caution in a female. Thyroid extract and oestrogens have also been advocated in this condition.

LETTERS, NOTES, ETC.

Vitamin E and Other Standards

Dr. PERCIVAL HARTLEY, F.R.S., Director of Biological Standards, National Institute for Medical Research, Hampstead, N.W.3, writes: In the *Journal* of July 10 (p. 61) under "Any Questions?" it is stated that there is no international unit for vitamin E. The circumstances under which an international standard, and an international unit defined in terms thereof, for vitamin E have been established and provided for international use are explained in the *Journal* of Oct. 18, 1941 (p. 553). Briefly stated, the international standard for vitamin E is a specimen of α-tocopheryl acetate, and the international unit is defined as the specific biological activity contained in 1 milligramme of the standard preparation. This opportunity is taken of reminding research workers and those laboratories and institutes in any part of the world who require international biological standards for their work that, on behalf of the Health Organization of the League of Nations, the international standards for drugs, vitamins, and hormones, and for antitoxins, antisera, and tuberculin (thirty standards in all established since 1922 by the League) are maintained at this Institute and will be supplied on application, free of charge, to the Directors of National Control Centres in those countries in which these have been established, or directly from this Institute to individual workers and others situated in countries in which such centres are not yet in operation (see *Journal*, July 6, 1940, p. 24).

"Morton's Metatarsalgia"

Mr. W. SAYLE CREER (Manchester) writes: In the section "Any Questions?" (June 26, p. 808) there is a short note relating to "Morton's metatarsalgia." It is, I fear, very inaccurate, as are most accounts of the condition. Your writer says: "Morton's metatarsalgia is not a diagnosis." He does not say what it is. Now "metatarsalgia" means pain—in the same way as neuralgia, neuritis, and sciatica mean certain pains—in the region of the metatarsal heads. The word denotes a symptom and not a diagnosis. But "Morton's metatarsalgia" does denote a diagnosis—a particular variety of metatarsalgia. It denotes pain of an intermittent, excruciating nature shooting into the second, third, or fourth toe. It was first described in 1875 by Prof. D. P. (or T. G.—various books give different initials) Morton, and attributed by him to pressure on a digital nerve by, at, or near one of the metatarsal heads. D. J. Morton says it is due to arthritis of a metatarso-phalangeal joint. It is a distinct, though rare, cause of pain in the forefoot. Prof. Morton was wrong in attributing it to pressure on digital nerves, just as Dr. D. J. Morton is incorrect in ascribing it to arthritis of the metatarso-phalangeal joint. The latter is a much more frequent condition with a distinctly different type of pain—stabbing, yes, but shooting, no. One always hesitates to say anything is impossible in surgery, or medicine, yet there is no other course left when considering the possibility of *normal* digital nerves being pinched by *normal* metatarsal heads. With a metatarsal head increased in size by osteophytes, as occurs in the condition caled "Kohler II," pinching is theoretically possible. I haven't seen it yet. Morton's metatarsalgia occurs with normal metatarsals only when there is a fibromatous or neurofibromatous enlargement of the digital nerve. But it is so rare that in fourteen years I have been tempted to operate only once; the enlargement was there. Excision cured the disease. I know of only three other cases. None has been published yet.

Disclaimer

Dr. A. GUIRDHAM writes: A pamphlet entitled *Revolt against Pity*, written by me, contains on its title-page several decorative additions, including references to periodicals, medical and otherwise, to which I have contributed. The form of this title-page was made without my being consulted, and the proofs were not submitted to me before publication, though the agreement signed with the publishers specifically indicated that this would be so. This pamphlet is non-medical and related to the present crisis. Nevertheless I would be glad if you would publish my objection to the above-mentioned additions to my name on its title-page.